PH AAA 111

SELECTED PAPERS ON NATIONAL INCOME METHODOLOGY

Compiled by the

NATIONAL ECONOMIC COUNCIL

Manila, September 1971

SELECTED PAPERS ON NATIONAL INCOME METHODOLOGY

Compiled by the

NATIONAL ECONOMIC COUNCIL

Manila, September 1971

Republika ng Pilipinas
SANGGUNIAN SA PAMBANSANG KABUHAYAN
(NATIONAL ECONOMIC COUNCIL)
P. O. Box 1116, Manila

Introduction

The following represents the important efforts of the past years undertaken towards the improvement of the sources and methods of Philippine national income accounts, although some of the points raised in the reports and articles in this compilation may no longer be applicable. Designed to assist in the overall evaluation of the income accounts, I am making this available to as many professionals and experts in the field who can contribute to the improvement of the estimates of this important set of economic data.

This compilation is part of a workshop in national income methodology sponsored by the Philippine Economic Society and financed by the National Economic Council. Through this workshop, those in the economics community can sit with those directly responsible for the compilation of the accounts and proceed to make suggestions on how our national income accounts can be improved.

Gerardo P Sicat
GERARDO P. SICAT
Chairman
National Economic Council

CONTENTS

		Page
National Income Estimates in the Philippines	C. L. Barber	1.1
Estimation of the National Income Accounts by the Operational Planning and Statistics, CY 1956-1962	Program Implementation Agency	2.1
A Critique of Capital Formation Estimates in Asia, With Special Reference to the Philippines	R. W. Hooley	3.1
Review of Economic Statistics in the Philippines	E. Levy	4.1
On the Accuracy of Philippine National Income Accounts . .	G. P. Sicat	5.1
Distribution of Gross Domestic Investment by Type of Capital Goods, Industrial Use, and Purchasers	R. F. Trinidad and L. L. Santos	6.1
Some Proposed Improvements in the Estimate of Capital Formation in the Philippines . . .	R. F. Trinidad	7.1

Contents (Continued)

Page

Time Trend Estimates of Net Value Added in Organized Manufacturing . . . . R. S. Mariano 8.1

The Usefulness of the Existing National Accounts for the Analysis of the Philippine Economy . . E. Levy 9.1

The Revised Philippine National Accounts . . . . M. L. Treadgold 10.1

Memoranda to NEC Chairman Gerardo P. Sicat on: Government Capital Formation in Durable Equipment (March 25, 1971), Estimates of the Gross Value and Value Added in Construction (May 7, 1971) PAENCOR Construction Estimates (August 26, 1971) . . . . . . F. Pante 11.1

Memorandum of Professor R. C. Turner to Director B. G. Bantegui of the Office of Statistical Coordination and Standards, National Economic Council, on the Structure and Format of the Philippine National Accounts (October 29, 1968) 12.1

-ooOoo-

The article below is reproduced from the Philippine Economic Journal, Vol. IV, No. 1 (First Semester 1965), 64-96.

NATIONAL INCOME ESTIMATES IN THE PHILIPPINES

CLARENCE L. BARBER*
University of Manitoba and McGill University

This report presents a critical evaluation of the national income estimates that are currently being prepared in the Philippines. Because the report is critical in nature emphasis inevitably tends to fall on the weakest segments of the present estimates. It is not intended to suggest by this that the estimates as a whole are weak or unreliable. Many improvements have

---

[Editor's Note: This paper was written while the author was Senior Adviser on National Income Statistics at the Statistical Center, University of the Philippines. With the current revival of discussion regarding the national income accounts of the Philippines, Dr. Barber's paper, which was available in limited mimeographed copies dated June 1960, regains new significance.]

*A preliminary draft of the main part of this report was completed early in 1959 and circulated in typewritten form. Since then there have been a number of developments on the national income front in the Philippines. First, estimates of net income derived from livestock and livestock products have been extensively revised and these new estimates were incorporated in the national income estimates for 1956-1959 released by the Office of Statistical Coordination and Standards of the National Economic Council about April 1st. Second, Mr. Trinidad has carried through an extensive revision of the estimates of investment for the year 1956. [See R. F. Trinidad, "Some Proposed Improvements in the Estimate of Capital Formation in the Philippines," The Statistical Reporter, Vol. 4 (April 1960)]. Third, in the latter part of April the Statistical Center and the Office of Statistical Coordination sponsored a series of four seminars on National Income. The papers presented at these seminars contain numerous suggestions for improvements in the national income estimates. In particular a paper presented by Mr. Bantegui, the Director of the Office of Statistical Coordination and Standards, "Development of New Source of Data for Improved National Income Estimates," outlines in some detail plans that have been made for the further improvement of current estimates. Rather than attempt to revise this paper to take account of all these actual and proposed changes I have decided to leave it largely in its original form except for minor additions and corrections. In addition, I have added as two appendices two further suggested improvements which are based on analysis undertaken since the original report was prepared.

been made in estimating techniques since national income estimation was first undertaken in the Philippines. And though many improvements must still be made the current estimates are undoubtedly the best single indicator of the economic progress that is taking place in the Philippines. Many of the weaknesses that still remain reflect the lack of good basic statistics in certain areas. By focusing attention on these areas it is hoped that this report will underline the need for improved basic data. In preparing the report I have relied heavily on the advice of the Head of the National Income Branch, Mr. P. S. Reyes, and on information obtained from discussions with members of his staff. I have also drawn heavily on Mr. R. F. Trinidad's Master's thesis, "Source and Methods of National Income Accounting in the Philippines."[1]

National income estimates in the Philippines are based primarily on the industry of origin approach. Income originating in each industry is estimated for one base year and these totals are then projected forward on the basis of various indicators. Other totals, such as gross national expenditure, are then obtained by adding or subtracting other totals to these estimates of national income.

Any set of national estimates can be evaluated either in terms of their accuracy as to the level of total income and its components or in terms of their accuracy in measuring the amount of year-to-year change. In this report, attention will be given first to the question of the level of income reported, and second, to the amount of change in income. This does not imply that the former is in any way more important than the latter since in a country keenly interested in economic development, particular interest attaches to the accurate measurement of year-to-year changes and to the change over a period of years. It is these latter measurements that record the country's progress in economic development.

PART I. ESTIMATION OF THE LEVEL OF NATIONAL INCOME

1. The Census Estimates for 1948

Present estimates of national income in the Philippines are, to a large extent, derived from the estimates prepared under the direction of Mr. William Abraham in 1952. The latter's estimates are based on the income totals reported in the 1948 Census of Population. Income data in this Census was reported under the following headings (on the Census Questionnaire):

---

[1] Unpublished manuscript, University of the Philippines, 1957.

Col. 21. Does this person work for others for wages or a salary?

Cols. 22, 23, and 24. Main Headings: Wages or salaries of persons working for others. Amount of money received. Subheadings: Col. 22 -- Monthly. Col. 23 -- Daily. Col. 24 -- Value of payment in kind received if any.

Cols. 25 and 26. Main Headings: Persons not working for others. Col. 25. What is principal source of income? Col. 26. Income from this source for October 1, 1947 to September 30, 1948. (1946 appeared on some of the printed schedule but when the enumeration data was changed from January 1, 1947 to October 1, 1948 the above change was written in on these schedules by the enumerator.)

Cols. 27 and 28. Main Headings. -- Additional Occupation. Subheadings: Col. 27. Name of additional occupation. Col. 28. Income from additional occupation in the last 12 months.

Col. 30. Number of weeks this person worked between October 1, 1947 and September 30, 1948.

In the published reports on the 1948 Census a total is given for income of all kinds with a breakdown by industry and province but no classification is given by type of income, salaries and wages, income from self-employment, etc. However, a fairly detailed frequency distribution is given for salaries, wages, and income from additional occupations.

Although there is no record of how these income totals were prepared, it is possible to reconstruct them in the following way (see Table 1). By multiplying the mid-point of each income class by the number reported for that class, totals can be obtained for estimated total monthly salaries, total daily wages, total annual income from self-employment and total annual income from additional occupation. If total monthly salaries are then multiplied by 12 and total daily wages by 280, the total reported by the Census can be obtained by adding these to income from self-employment and from additional occupations. A work year of 280 days is equivalent to a 5-1/2-day week less 6 national holidays. The total for salaries and wages obtained in this way approximates the total estimated by Mr. Abraham as published in his report, "The National Income of the Philippines and its Distribution."[2]

---

[2] United Nations, New York, 1952.

Information from some of the people who were involved with the 1948 Census tabulations indicates that just prior to the Census the enumerators were instructed to include under Column 26 not only the income of the self-employed but the annual income of salaried and wage personnel as well. However, because the printed schedule carried the heading "Persons Not Working for Others" and because these instructions did not reach all enumerators in time this instruction was not followed in all cases. Where no income was reported an estimate was prepared using the monthly salary or the daily wage and the estimate of the number of weeks worked during the year as a guide. A reference to this matter in Mr. Abraham's doctoral dissertation, "Problems of National Income Measurement in Underdeveloped Countries, with special reference to the Philippine Islands," seems to confirm this information.[3]

One unusual feature of the 1948 Census totals on income is that all employed persons are shown as having an income either in the form of a salary, a wage, or income from self-employment. In contrast, data from the Philippine Statistical Survey of Households (P.S.S.H.) show that some 25 per cent of the total employed labor force consist of unpaid family workers. According to information supplied by a former Census employee, in the 1948 income tabulations unpaid family workers were arbitrarily assigned a wage income of 1.50 pesos per day. This wage was then multiplied by the estimated number of weeks worked to obtain an estimate of annual income. Since Census enumerators were instructed to include vacation time as part of the number of weeks worked in the case of unpaid family workers, it is clear that this procedure would lead to a substantial overstatement of total income. Unpaid family workers are particularly important in agriculture, currently amounting to 35 per cent (average for October 1956 and October 1957) of the total employed labor force. Moreover, it is evident that unpaid family workers in agriculture in 1948 were classed as wage earners since 1,380,000 wage and salary earners were reported for agriculture in that year, almost double the current total even though the total employed labor force in agriculture has increased since that time by almost 50 per cent (see Table 2). Further, despite a 50 per cent increase in total employment, the total amount of wages and salaries earned in agriculture for the year ended February 28, 1957 was only 20 per cent higher than the estimate in Table 1, derived from the 1948 Census.

Finally, it should be noted that the income in kind reported on the 1948 Census schedule was lumped together with cash income in the published totals. It is not known how completely this item was reported.

---

[3] A microfilm of this thesis is available in the Institute of Public Administration Library, University of the Philippines. [The thesis is abstracted in this Journal, pp. 139-40 below. -- Ed.]

On the basis of the above analysis, I would conclude that the 1948 Census totals substantially overstate income received in the form of salaries and wages and possibly total income. This would be particularly true of agriculture where unpaid family workers are very important and to a lesser extent in commerce and manufacturing, both of which are industries with a significant number of unpaid family workers. Some overstatement may also have resulted where the number of weeks worked multiplied by the daily wage rate was used as a basis for estimating total wage income. One person who was involved in the 1948 Census tabulations has expressed the view that in reporting total number of weeks worked, the Census enumerator did not always adjust his data to give equivalent number of full time weeks but sometimes simply reported the number of weeks in which some work was done.

Although for the reasons outlined above data on salaries and wages may be overstated in the Census tabulation, this could be offset in the overall totals by under-reporting for other types of income. Thus, it is customary for underreporting to occur in survey or census data collected on income. This is particularly likely to occur in the case of income from self-employment (including business and professional income) because of memory bias. There may also be some reluctance by people in this group to give their true income because of fear the data will be used for tax purposes. On the other hand, the 1948 census data on salaries and wages is less likely to suffer from under-reporting. Because this form of income cannot easily be concealed from the tax authorities, they have less reason to understate it.

I would conclude on the basis of the above discussion that although the total income reported in the 1949 Census may not be far from the true total (after the adjustments made by Mr. Abraham), this result is to some extent accidental, an overstatement for salaries and wages offsetting a probable understatement for income from self-employment.

It would seem clear from the above analysis that the 1948 Census does not provide a good basis for estimating the proportion of national income paid in the form of salaries and wages. Mr. Abraham in his 1952 report used the percentage of salaries and wages to total income (excluding corporate and government income) as shown by the 1948 Census data to estimate these totals for other years. This method has been continued. Thus, the current estimates of salaries and wages assume that the same percentage of national income is paid out in the form of salaries and wages as was estimated to be the case in 1948. I would recommend that no further estimates for salaries and wages be published until new current data are available to provide a basis for estimates. Not only is there no reason to suppose that the ratio of salaries and wages to total income would remain constant, there is also serious doubt as to accuracy of the proportions derived from the 1948 Census.

It should further be noted that although in the national income total for 1948 an overstatement for salaries and wages may roughly offset an understatement in income from self-employment, the accuracy of this offsetting effect may vary widely from industry to industry. Thus, the reported income totals on an industry-by-industry basis are probably subject to a substantial margin of error. For example, in both construction and professional service, estimated income from self-employment appears rather small relative to other types of income in these two industries (see Table 1).

2. Adjustments to the 1948 Census Totals

Income reported in the 1948 Census of Population did not include all types of income. It was confined to income in the form of salaries and wages, income from self-employment or from one's own business and income from additional occupations that were secondary to the primary occupations. For gainfully occupied workers with their own business or self-employed, the Census schedule asked them to report their principal source of income and the income received from this source in the year ended October 1, 1948, It is possible that in some cases the principal source of income may have been from the ownership of farm land or other investments and the income reported, the income derived from this source. Because the published totals were incomplete, a number of adjustments were made in the report prepared under the direction of Mr. Abraham. Unreported income in kind, other private income, and the property income of government were added and transfer payments and foreign donations were deducted (see Table 3). Let us consider these adjustments in turn.

In addition of 424 million pesos was made to the income of agriculture to cover the unreported value of food consumed by farm workers and farm families (320 million) and the increase in the value of livestock on the farm (104 million), Since in a separate estimate it was reported that total income in kind of farm workers, farm operators and their families amounted to 560 million pesos, it can be assumed that the 1948 totals for agricultural income were estimated to include 136 million pesos of income in kind. It is not known what basis there was for this estimate. However, these estimates must all be treated with a good deal of reserve since a recent survey has shown that in 1957 some 41 per cent of all rural income in the Philippines was received in a non-cash form. The remaining additions for unreported cash income consisted of an allowance for income in kind to domestic servants, an estimate of the value of capital improvements carried out by the farmer, mainly allocated to construction, and an allowance for the rental value of occupied dwellings.

Other private income was defined as the undistributed profits of corporations plus corporate profits taxes. Alternatively, it can be defined as total corporate profits less dividends. No explanation is given as to why dividends were omitted. In fact, it is clear that this omission was a mistake. No information was requested in the 1948 Census on investment income except where this may have been reported as the principal source of income and the published totals do not include any allowance for such income.

There are indications that the estimates prepared under Mr. Abraham's direction proceeded on the assumption that the Census totals were in some way equivalent to the national accounts total of "personal income". This may explain the omission of dividends and a number of other items.

In allocating other private income to different industries, it was assumed that none of it would accrue to agriculture and that the remainder should be allocated on a pro rata basis. As a result, government, the income of domestic servants, and the rental value of occupied homes received their proportionate allocation. Since in all three cases corporate income would be negligible or non-existent, it would be better to allocate it to the remaining industries after the exclusion of these three groups as well as agriculture. Alternatively, some analysis could be made of corporate income tax returns to determine a better basis for the allocation of corporate income by industry.

The decision to deduct transfer payments and foreign donations also appears to have been a mistake. Since these items would not appear directly as income reported to the 1948 Census, there is no basis for deducting them from the Census totals.

In addition to the above adjustments, some allowance should have been made for other forms of property income. Thus, the present totals fail to include interest income and the net rental value of non-farm non-residential property. In theory one would expect that the Census estimates would also fail to include farm rents (unless reported as the principal source of income). However, since an alternative method was adopted for the estimation of agricultural income and since this latter method in effect provides for the inclusion of all income originating in agriculture, it will include net farm rent as part of this total.

One further adjustment was made to the totals secured by the additions and subtractions cited above. An independent estimate was made for net income originating in agriculture. This was obtained by valuing estimated production for all the different crops and livestock products and deducting from the total obtained in this way an allowance for expenses such as seed, livestock feed, fertilizer, taxes, etc. This total was adopted as providing the most accurate estimate of income originating in agriculture. However, since the adjusted Census total for agriculture exceeded this total by 529 million pesos a corresponding addition was made to manufacturing, construction, and trade. No reason is given for adding these large amounts, about 45 per cent, to the adjusted Census income totals for these three industries. In a subsequent revision carried out by the Central Bank, the total income produced in manufacturing was reduced from the total of 656 million pesos as estimated in Mr. Abraham's report to 440 million pesos, an amount much closer to the adjusted Census total before this large addition. However, the 1948 published totals for construction and trade still include these artificial additions. In my opinion, the totals for construction and trade should also be revised to remove this unexplained addition.

To sum up this discussion I would recommend the following:

(a) The individual industry totals for national income for 1948 should be revised to include dividends as well as other components of corporate income plus some allowance for interest income and non-farm non-residential rents.

(b) In allocating corporate income to individual industries, domestic service, government and the rental value of occupied homes should be excluded as well as agriculture.

(c) Transfer payments and foreign donations should not be deducted from the 1948 Census totals.

(d) The inter-industry adjustment which added some 526 million pesos to manufacturing, construction, and trade should be removed.

(e) These revisions should be made subject to one major reservation. Since the 1948 Census totals for individual industries may be subject to a considerable margin of error, it would be desirable to prepare new current estimates on the level of national income in individual industries wherever this is possible, and revise the estimates for earlier years in line with these new estimates.

A further check on the accuracy as to level of the current national income estimates is provided by the family income data recently published by the P.S.S.H. The P.S.S.H. has estimated that for the year ended February 28, 1957 family income in the Philippines was 5,824 million pesos or only about 72 per cent of the roughly comparable total for personal income in 1956 published by the National Income Branch. The N.I.B. estimated personal income for 1956 at 8,058 million pesos. While in principle the national income totals include the income of non-profit institutions whereas this would be excluded from the P.S.S.H. totals, in fact no specific estimate has been made for these institutions in the totals published by the National Income Branch. In any case, it seems likely that the income received by these institutions would be comparatively small. Income from property owned by religious institutions is a possible exception. It is true, of course, that in other countries estimates of family income based on sample surveys have usually under-estimated the comparable national accounting totals which are based largely on data that originate from accounting records and from a variety of other sources. Table 3 gives a comparison of the results obtained from survey data with the corresponding national income total for the Philippines and a number of other countries. The ratio of income coverage shown for the Philippines is slightly lower than that obtained in any of the other surveys listed in Table 3 but it is not widely out of line with them. However, since the primary base of the present national income estimates in 1948, the 1948 Census of Population totals, was also data of the survey type there was less reason for expecting a discrepancy in the Philippines. It seems clear from this comparison that the P.S.S.H. family income totals are quite consistent with the conclusion reached above that there may be some overstatement in the 1948 Census of Population totals on income.

PART II. ESTIMATION OF THE AMOUNT OF CHANGE IN NATIONAL INCOME

In the Philippines the estimation of national income by industrial origin forms the basic total from which numerous other estimates are derived. Accordingly, in evaluating the accuracy of current estimates from the viewpoint of year-to-year changes, attention will be given to estimates of the income produced in the different industries.

1. Agriculture, Fishing and Forestry

(a) Agriculture

(1) Crops. Income originating from crops is now based on the sample survey of crops and livestock which has been conducted annually since 1954. This survey obtains data that is independent of historical estimates and due to the way the sample is constructed, it makes allowance for any decrease or increase in the number of farms and the amount of farm land under cultivation. Thus, although the estimate is subject to usual sampling errors, it should give a reasonably accurate estimate of year-to-year changes in crop output.

Prior to 1954, estimates of crop production were based on reports submitted by agricultural representatives. Since these estimates

Table 3

A COMPARISON OF FAMILY INCOME REPORTED IN SAMPLE SURVEYS WITH THE CORRESPONDING NATIONAL ACCOUNTS TOTAL FOR PERSONAL INCOME

	Survey Total as Percent of Personal Income
Philippines	
1956-1957 PSSH Survey	72
United States	
1. Federal Reserve Board Survey	
1945	77
1946	83
1947	90
1948	92
2. Bureau of the Census	
1944	78
1945	74
1946	78
1947	80
3. Bureau of Labor Statistics	
1941	75
Canada	
1952 Survey of Non-Farm Income	94

SOURCE: Data for the United States are taken from S. F. Goldsmith, "Appraisal of Basic Data for Constructing Income Size Distributions," Conference on Research in Income and Wealth. Studies in Income and Wealth, Vol. 13 (National Bureau of Economic Research, Inc., New York, Riverside Press, 1951), 266-372. Data for Canada are as given in S. A. Goldberg and J. R. Poduluk, "Income Size Disttribution Statistics in Canada -- A Survey and Some Analysis," Income and Wealth, Series No. 6 (International Association for Research in Income and Wealth, London 1957), 155-201.

were not based on a scientifically designed sample, they are likely to be somewhat less accurate than current estimates. Estimates of crop production for the earlier period from 1946 to 1953 have been tied into estimates for the later period since 1954 to form a continuous series. However, no very precise basis was available for linking up these two series, so in general, estimates of changes in crop production are likely to be more accurate for the period since 1954 than they are for longer periods.

(2) Livestock. Data on livestock production are now available from the Crops and Livestock survey as well as from reports submitted by municipal officials. The data currently used in preparing estimates of national income for this sector are obtained from the Bureau of Animal Industry. I am still not clear on how fully they utilize all available information and it might be useful to call a conference of interested groups to discuss estimates in this sector. In general, the remarks made above with respect to the relative accuracy of estimates before and since 1954 apply to livestock also.

(b) Fishing

Estimates of fish production which form the basis of the current estimates of income from fishing appear to be little more than rough guesses. The commercial catch is multiplied by three to allow for under-reporting to avoid payment of tax. Output of fishponds is obtained by applying a pre-war yield figure to the acreage leased for fishpond purposes. Output of municipal fisheries is based on a sample of two municipalities; one of these is used to estimate output in the North and the other to estimate output in the South, the yield for one municipality being multiplied in each case by the total number of municipalities.

On this basis, total fish output for 1957 was estimated to be the equivalent of 45 grams per person per day. Yet, a careful dietary survey which weighed actual fish consumption in a random sample of households found that per capita fish consumption (e.g., canned fish) amounted to 137 grams in the Bicol Region and 120 grams in Central Luzon.

(c) Forestry

Income from forestry is based on production of timber cut and lumber sawn as reported to the Bureau of Forestry. Monthly reports are required by law and forestry charges are levied on the basis of these reports. Although there is undoubtedly some timber cutting without permit, it is believed that estimates here are fairly accurate. However, a large volume of minor forest products such as bamboo, nipa palm and firewood are not recorded.

2. Mining

All the larger mining firms report output and submit some cost data. Information is fairly complete except for a few types of non-metallic minerals such as sand and gravel. Thus, the estimate of income produced in this industry is believed to be quite accurate.

3. Construction

Income produced in construction is estimated by applying an index of the value of total construction to the estimate of income produced in construction reported in the 1948 Census. The value of construction is the sum of private building construction, farm construction and government construction. Government construction is obtained from the reports of the Department of Public Works. Farm construction has been assumed to remain constant at the amount of 10 million pesos. Private building construction is estimated on the basis of the value of building permits issued in the City of Manila, the latter being assumed to equal 30 per cent of all building construction.

It is clear that this provides a rather rough estimate of the amount of income produced in construction. There is no reason to assume that building construction in Manila will remain a constant proportion of the total private building construction or that farm construction will remain constant. Further, the ratio of income produced to the total value of construction, which has implicitly been assumed constant, may vary from year to year. It is not possible to determine whether the resulting series overestimates or underestimates the true change in income. It should also be noted that income from self-employment reported for the construction industry in 1948 appears unreasonably low (see Table 1).

4. Government

Income originating in government is based on the accounting records of the government and is believed to be quite accurate.

5. Manufacturing

From 1946 to 1949, income produced in manufacturing as reported to the 1948 Census was extrapolated on the basis of an index

17

of the total income produced in the four industries of agriculture (including fishing and forestry), mining, construction and government. From 1949 to 1951, it was estimated on the basis of an index of gross sales of a constant number of manufacturing firms prepared by the Central Bank. Since 1952, income produced in manufacturing has been estimated in the following way:

From a survey conducted by the Central Bank for a large number of manufacturing firms (900 or more since 1953) the average value of production per firm was estimated. For each industry group, classified at the four-digit level, this average value was then multiplied by an estimate of the total number of firms. This in effect assumes that the firms not covered by the bank's list are of the same average sizes as those included in the list. The year-to-year change in the total value of manufacturing production estimated on this basis will reflect the change in the total number of firms and the change in the average value of production for firms included in the list. Although it may be noted that in 1956 the firms included in the Bank's sample accounted for 60% of total production as estimated by the 1956 Annual Survey of Manufactures, the accuracy of the resulting series is difficult to evaluate. In a country that is industrializing, it is particularly important to make an allowance for an increase in the total number of firms and the above method does this.

Net income produced by manufacturing was derived from financial reports submitted to the Bank.

To the above total was added an estimate of the income produced in processing cane sugar, in milling rice and corn, and the value of export products of cottage industries. These three groups had not been included in the above total.

A special study prepared by the National Income Branch comparing the net income produced in manufacturing, calculated on the above basis with the net value added by manufacture as reported by the Survey of Manufactures appears to indicate that the estimates based on Central Bank data overstate income produced in manufacturing for 1956 by about ₱200 million. However, this comparison should be reviewed in that it fails to allow for the fact that the Survey of Manufactures does not include the major portion of the rice and corn milling industry that its estimate of value added by sugar refineries may include some farm income, and that net value added by manufacture needs to be reduced by 20 or 25 per cent (according to North American ratios) in order to obtain net income produced in manufacturing.

The net conclusion of this discussion is that the accuracy of the present basis of estimating net income produced in manufacturing cannot be readily evaluated. It is clear, however, that estimates for the period 1946 to 1949 are very weak, since there is no reason to expect manufacturing output to move in the same way as the four basic industries used to project the 1948 estimate.

6. Transportation, Trade, and Recreational Services

For the period 1946 to 1951, it was assumed that net income produced in each of the above industries moved in the same way as income produced in the four industries: government, construction, agriculture, and mining. Since 1951, net income has been projected by a sales index for a constant number of firms; 96 in transportation, storage (and communications plus electricity, gas, etc.), 479 in trade, and 39 in recreational services.

In a growing economy, it seems likely that an index based on a constant number of firms will understate the total growth in sales and income. This might not be true if some concentration was occurring in the industry but there is not much evidence that this has been occurring.

For the period from 1946 to 1951 it seems likely that a combination of agricultural production plus imports less exports would afford a better basis of estimation than the method used at present.

7. Personal Services: Educational, Professional, and All Other

For the period 1946 to 1951 in the case of personal services and from 1946 to 1950 for the remaining group, estimates of income were apparently prepared by projecting the 1948 totals on the basis of the same index used for manufacturing, that is, an index of the unrevised totals for agriculture, mining, construction, and government up to 1949 and an index based on the sales index for manufacturing compiled by the Central Bank from the date forward.

From 1952 to 1955 income originating from personal services were based on a variety of sources including population growth and other indicators. Since 1955 it has been based on the Central Bank's index of sales for personal service establishments. It should be noted that on the basis of the data given in the 1948 Census about two-thirds of the total was the income earned by domestic servants. For this segment it would appear inappropriate to use the Central Bank index which relates only to business establishments. The ten per cent decline in this series from 1951 to 1952 is apparently based on a similar decline in the Central Bank's sales index for personal services in this period.

Since 1951 income originating in educational services has been based on a survey of income and expenses of private schools, and on the annual statistics on number of schools of the Bureau of Private Schools. Income originating in each type of school as shown in the sample survey is multiplied by the total number of school of that type, e.g., kindergarten, primary, intermediate, etc. It is stated in Mr. Abraham's report that income earned in public schools was included under government. However, the total income reported for professional and educational services in 1948 is almost identical with the Census total and it is quite clear from Census data that all public school teachers were classified under education. Hence, the 1948 total includes both public and private educational income. Current year totals are for private schools only.

In 1956 income originating from the professional service industry was based on an estimate of the total number of professional persons in private practice in each of some ten professions and on a survey of incomes earned by professional workers in private practice. It should be noted that the resulting total, income of professional practitioners, is a different total from that reported in the 1948 Census. The latter total included all income earned in the professional service industry, income of salaried workers, stenographers, clerks, etc., as well as the professionally trained people. This, the total currently being used in this industry is incomplete. It is not known how the new estimate was linked up to the old.

The net rental value of occupied dwellings is estimated on the assumption that the size of households and the net rental value of dwellings have not changed since 1948. Dividing estimated total population by the average size of household gives an estimate of the total number of households. This total is then multiplied by average net rental value to get estimated net rental value of dwellings.

All other income was projected on the same index as trade and transportation up to 1951 and on the basis of the Central Bank general sales index since that date.

There is an unexplained decline of about ten per cent between 1950 and 1951 in the total income for the combined educational, professional and all other group.

1.15

SUMMARY AND RECOMMENDATIONS

1. It is clear that for the period from 1946 to 1950, estimated national income is little more than a projection of agriculture, mining, government and construction with agriculture accounting for about 80 per cent of these four industries. Since 1951, considerable additional information has been available on which to base the estimates in these other industries. However, to a very large extent, estimates in this sector are based on the sales indexes published by the Central Bank. Since 1957, the Bank has not published this index reporting that the index is under revision. It would be highly desirable if this revision was carried out in such a way as to incorporate in the index some allowance for growth in the number of stores.

2. At the present time, the National Income Branch has on its worksheets supporting estimates for income totals by industry only for the period since 1956 when it took over the job of income estimation from the Central Bank. The supporting worksheets for earlier years appear to have been mislaid and are not available. This is clearly an unsatisfactory situation. The National Income Branch should take the earliest opportunity to prepare revised estimates for each industry for the period from 1946 to date so that it will be in a position to explain and defend all of the published estimates. This work is particularly important in that there were numerous changes in estimating procedures for individual series of the period and it is possible that different segments of these series were not linked together on a consistent basis.

3. The Central Bank should be asked to continue publication of its sales index on an improved basis since this provides the primary source for a large segment of national income.

4. Estimates of professional income should be revised to place them on a basis consistent with the 1948 totals.

5. The domestic service component of personal services should be estimated separately from the remainder of this total since the Central Bank sales index for personal services does not include domestic servants. P.S.S.H. data provide an alternative basis for estimating the income of domestic servants.

6. In revising the series for income originating in manufacturing, it might be desirable to use the 1956 Survey of Manufactures as a

basis for establishing the level of income in manufacturing and revise the totals for earlier years in line with this new total.

7. Income produced in education should be revised so as to include private education only in 1948 or the series should be revised to include all income earned in education, government and private, as recommended in the I.S.I.C. for all years. It is clear from the above analysis that the estimates of income originating in a number of industries are subject to a number of sources of error. Where income in a base period is projected on an index of sales or some other indirect indicator it is not only possible that the indicator may not provide an accurate measure of change for the whole industry but it is also possible that the ratio of income produced to total sales may change over time. As long as the present method is continued, no check is available on whether the income estimate is becoming seriously erroneous.

One check on the accuracy of present national income estimates would be that provided by an independent estimate of gross national expenditure. At present all items on the expenditure side are estimated independently with the exception of consumer expenditures which is obtained as a residual. Recently with the completion of a survey of family incomes and expenditures and a survey of manufacturing production, additional data bearing on the estimation of consumer expenditures have become available. I would recommend that an independent estimate of consumer expenditures for the year 1956 be made on an experimental basis and that consideration then be given to the problems involved in continuing the series on a regular basis. The survey of retail and wholesale trade which is now underway should also be helpful here.

8. In view of the rapid growth in the number of people engaged in independent professional practice, it would be desirable to survey income in this area every two or three years since changing competitive condition might produce considerable change in income levels. Further, because much of the growth is in the younger age groups, it might be useful to cross-classify professionals by income and age to provide a basis for the more accurate estimation of income levels.

At some time in the future, consideration should also be given to developing a series on national income by type of income. The basic core necessary to develop a decent set of estimates of this kind is a good estimate of total salaries and wages. Some information on salaries and wages are now available from the P.S.S.H. Additional data might be obtainable from the Social Security System. The present estimates of farm income, professional income and other private income, can be used directly or with only slight modifications. The most difficult area would be the estimation of income of non-farm unincorporate enterprise. Although this is a problem in most countries, it is a sector of greater importance in the Philippines than it is in more industrialized countries. However, it should be given a place in future plans. An estimate of national income using this approach would provide an added check on the present estimates.

PART III. DETAILED COMMENTS ON PARTICULAR SECTORS

1. Agriculture

Present estimates of income from crops are obtained by averaging data for two crop years each ending in June 30. It might be well to examine the pattern of each crop and see if the division may not be made crop by crop. Perhaps in some cases, an 80:20 or some other ratio may be more appropriate than taking half of each crop year. However, any revision would probably have to be carried back to the start of the present series in 1946.

In a number of instances, especially for livestock products, products are valued at retail prices since farm prices are unavailable. In calculating net income originating from these products the net to gross ratio should presumably then include an allowance for the difference between retail and farm prices. It is not clear that this allowance is made.

Present estimates for the value of livestock products appear relatively high compared with the value of crops. For example, in 1956 the net income from livestock products amounts to 1,063 million pesos compared with 1,614 million from crops. In particular the value of egg production in 1956 seems very high, some 295 million pesos, or more than half the value of palay. It appears that there may have been a serious overestimate of the number of laying hens.

2. Mining

It might be possible to estimate the output of sand and gravel on the assumption that there would be a fairly constant ratio between sand and gravel used and the consumption of cement, or of cement and asphalt.

Present data collected on cost of production appears to contain no provision for the cost of explosives and supplies. It might be more straightforward to collect data on salaries and wages paid and other forms of income originating in the industry rather than collecting every thing else but this.

3. Professional Service

In estimating professional income, an allowance is made for number of deaths. This seems to imply that there is not a flow of new graduates onto the market more or less continuously.

4. Gross Domestic Investment

At the present time expenditures on durable equipment are estimated mainly on the basis of production plus imports less exports. After taxes and duty have been added a percentage mark-up is applied to cover transport costs. The present markup is based on a survey made by the Central Bank in 1955. With the increasing scarcity of dollars it is possible that dealers' margins on imported goods may have widened. Hence, there is a need to review this earlier data. In addition, the 25 per cent margin applied to domestic goods seems low if it is to cover transport and installation costs as well as dealer's margins.

It is not clear why radio parts, refrigerators, phonograph parts and sinks, washbasins, baths, etc., should be included as part of machinery and equipment. Some of these items are more properly classified as consumer goods, and some as building materials.

Present estimates of construction are peculiarly subject to error. Estimated value of private building construction is based on the assumption that construction in the City of Manila amounts to a constant 30 per cent of construction in the Philippines. Construction in the City of Manila, in turn, is based on the value of building permits issued by the City. Thus, the estimates may be erroneous on two counts. Not only is there no reason to suppose that construction in Manila will remain a constant per cent of the total but in addition permit values may not give an accurate estimate of the amount of construction that takes place. Some permits may be allowed to lapse or construction may take place in a different year from that in which the permit was issued. Permit values may not correspond at all closely to final expenditures.

The present estimates would be improved if the value of private building construction was based on the permits issued in Manila and some 27 other cities rather than on Manila alone. It would be desirable to check permits issued for some recent year on a random sample basis in an attempt to determine what correspondence there is between permit valuations and final expenditures.

An alternative to the present estimates would be to construct a series on the consumption of building materials using imports and domestic production, and subtracting exports. Then, if the average ratio between the value of materials and the total value of construction could be determined, this would provide the basis for an alternative estimate of the total value of construction. Deducting government construction would leave private building construction as a residual.

Still another check on the overall value of total investment expenditures would be provided if a Census of Capital Expenditures was undertaken. All larger firms and a sample of smaller firms could be asked to report their expenditures for capital purposes. This would provide a benchmark estimate that could be used as a basis for current estimates thereafter.

There is undoubtedly a significant amount of construction carried on by firms using their own employees. This "own-account" construction may not be counted with present methods of estimation. In addition, I have been told by at least one business firm that with the difficulty in obtaining dollar allocations that now exists, some firms make quite a bit of their own equipment.

In the above comments I have not mentioned improvements that are already underway in the National Income Branch but have not yet been incorporated in the estimates that are currently published.

PART IV. GENERAL RECOMMENDATIONS

1. In my view it would be highly desirable to have the National Income Branch draw up an integrated program for the long range improvement of National Income estimates in the Philippines. This program should establish priorities for the improvement of specific areas, outline additional basic data required for national income purposes and review the timing of release of new revisions.

2. As part of this program specific consideration should be given to the use that can be made of data gathered by the Philippine Statistical Survey of Households. What us is currently being made of this data? What additional data could be gathered that would be of particular use for national income estimation?

3. Again as part of this program, some attempt can be made to evaluate the extent to which national income estimates will be able to utilize the data becoming available from the 1960 Census of Population, Housing and Agriculture. What estimates will be affected by this new data both directly and indirectly through revisions that may be made in other series as a result of the new Census data?

4. Specific consideration should be given to the question of when it will become desirable to estimate major components that are not now estimated directly. For example, when should an attempt be made to estimate consumer expenditures directly rather than as a residual? When should national income be estimated by major type of income, e.g., salaries and wages, rent, interest, corporate income, farm income of non-farm unincorporated business, etc.?

5. The present decision that no basic revisions of national income data should be published until 1962 should be reviewed.

APPENDIX A

A NOTE ON THE ESTIMATE OF AGRICULTURAL INCOME FOR 1958 AND 1959

In the current estimation of net income produced by agriculture in the Philippines, net income from crops is based to a very large extent on gross value of production data published by the Agricultural Economics Division (AED) of the Department of Agriculture and Natural Resources. Exceptions occur in the case of copra, dessicated coconut, and sugarcane. For all other crops the AED estimates are used and these data are valued at a weighted average of prices in the six-year period 1953-58.

Since national income is defined in terms of income earned at current prices, the resulting totals differ from what the normal user of national income data would expect. They are neither measured in terms of current prices or constant prices but in some combination of both. Thus, although the sharp rise in copra prices during 1959 is fully reflected in the income data, the substantial fall in palay prices is excluded. This may, in part, explain why the implicit price deflator for income produced by agriculture showed an increase of about 2 per cent from 1958 to 1959.

In fact, the situation is even more complex than has been indicated thus far. Net income produced in agriculture for 1958 is based on an average of crop year data for 1957-58 which fully reflect current prices and data for 1958-59 which with the exception of coconut products and sugarcane are based on six year average of coconut products and sugarcane are based on six year average prices. Net income data for 1959 are based on an average of these same 1958-59 data plus forecast data for 1959-60. The forecast data are also valued at six-year average prices except for coconut products and sugarcane which are at current prices. It is clear from this analysis that the published income totals in agriculture for 1958 and 1959 are very difficult to interpret even when the user knows how they were prepared. To the uninformed user they might easily be seriously misleading. I would strongly recommend that all value of production data used in the preparation of net income produced by agriculture by converted to a current price basis. Not only would their meaning be more straightforward and easily understood but the resulting income totals would correspond much more closely to the income actually received by and available for expenditures by the farmer.

APPENDIX B

A NOTE ON THE METHOD OF CALCULATING INCOME FROM PROCESSED AGRICULTURAL PRODUCTS

1. Rice Milling

At the present time, net income produced by the rice milling industry is calculated by valuing the clean rice *mata-mata* and *darak* milled from palay at Bureau of Commerce wholesale prices and deducting an estimate of production costs. Production costs are estimated as palay output valued at farm prices as obtained from the Agricultural Economics Division of the Department of Agriculture, plus an estimate for depreciation at 2.5% of the value of clean rice.

In the period 1957 to 1959, this method gave the following estimate of net income produced in the rice milling per metric ton of palay milled.

	1957	1958	1959
Net income per metric ton (pesos)	49.83	84.55	20.21

According to expert opinion in this field, it is not uncommon for rice millers to mill palay in return for the by-products only (i.e., *mata-mata* and *darak*.) If this basis had been used to estimate net value added the following results would have been obtained.

	1957	1958	1959
Value of *mata-mata* and *darak* (Million pesos)	42.0	38.6	38.4
Net income per metric ton of palay (pesos)	12.82	11.21	10.14

I have also been informed by Mr. De Dios of NARIC that the government places a ceiling price on charges for rice milling of 80¢ per sack of 56 kilos clean rice of Macan 2nd class. Ceiling prices for higher qualities are slightly higher. This is equivalent to a ceiling of 9.29 pesos per metric ton of palay which is only slightly lower than the rates obtained if it is assumed that the miller receives the by-products in return for his services. Officials of NARIC expressed the view that millers could not make money at 80¢ per cavan of milled rice.

The preceding analysis would suggest that the present method of estimation results in a serious overestimate of the income produced by rice millers. This probably arises because of the fact that palay prices are farm prices obtained directly from the crops that livestock survey whereas the prices of rice and by-products are wholesale prices for central market areas which include a substantial element of transportation and handling charges. Since a large proportion of the rice is never delivered to these central places it is not proper to include income estimated on the assumption (implicit) that such delivery occurs.

The marked fluctuation in income produced from rice milling between 1957 and 1959 is due to the fact that the value of palay production for the crop years 1958-59 and 1959-60 was derived by multiplying production data by 6-year average prices. As a result, the rise and fall in wholesale prices of rice and by-products was not offset by a corresponding rise and fall in palay prices. This is evident from the following price data:

	Palay, A.E.D.		Rice	Palay
	Average Farm Price[1]		Wholesale Price[2]	Wholesale Price[3]
1957	8.89		21.38	10.30
1958	8.62		24.30	12.00
1959	8.54	6-year averages	18.10	8.42

---

[1] Average farm price per sack of 44 kilo.

[2] Bureau of Commerce, per sack of 56 kilo.

[3] Palay ordinario in Cabanatuan City per sack of 44 kilo.

If the average farm price had been allowed to vary in the same way (percentage-wise) as the wholesale price at Cabanatuan City the following results would have been obtained:

	1957	1958	1959
Farm price of palay per kilo	.202	.235	.165
Cost of milled palay (million pesos)	615.	753.6	581.2
Depreciation 2.5% of clean rice	19.4	23.0	18.5
Total cost of production	643.6	776.6	599.7
Value added by rice milling	163.2	165.3	178.3

This result is much less irregular than the present estimates of the National Income Branch and appears to be a more reasonable result. However, as was pointed out above it may overestimate the net income produced by the rice milling industry.

On the basis of the above analysis, I would suggest that one of the following alternative procedures be followed:

Alternative One:

Continue the present method with the following changes. Apply the present method only to the 44 per cent of total palay output estimated to enter regular commercial channels. In carrying out the estimate, make sure that the average farm price of palay is for the current year and not the average price for a number of years. If the value of farm output published by the AED uses a five-year average price, then the N.I.B. should estimate the current price on the basis of the change shown in the wholesale price of palay at the basis of the change shown in the wholesale price of palay at Cabanatuan City. For the remaining 56 per cent of total output, use the method suggested in Alternative Two or assume a flat custom milling rate of say one peso per cavan of clean rice.

Alternative Two:

Estimate income produced from rice milling as equal to the value of the by-products, i.e., darak and mata-mata. The value of these can be estimated as at present. Because the prices for the by-products are wholesale prices at larger trading centers, this may to some extent overestimate the value added for palay milled locally or pounded on the farm. On the other hand, the larger mills perform an extensive storage and transport function by collecting palay from the farm and transporting it to major trading centers in their own trucks and by storing the finished products for consumption later in the year.

Estimation of the income of rice mills is complicated by the fact that they combine in one firm functions that fall logically into the different industries of manufacturing, storage, transport and trade. It would be very difficult if not impossible to try and separate the income earned in each of these functions. However, since it appears doubtful that this income will be estimated in any other way, it is desirable that some estimate be made for it here. For this reason, I would recommend that Alternative One be followed.

2. Corn Milling

Current estimates of the value added or income produced by corn millers make the assumption that only 30 per cent of the shelled corn (after a 14 per cent allowance for seed, feed and wastage) is actually milled. This 30 per cent seems to correspond roughly to the estimate published in the Stanford Research Institute study of Philippine Domestic Transportation which estimated that 29 per cent of total output went into the hands of corn dealers.[1] Conversation with officials of NARIC indicate that a much larger proportion of the corn is actually milled although much of it is milled on a custom basis in local mills for the farmer's own use. I would recommend that it be assumed that about 80 per cent of total shelled corn is actually milled. This would allow 20 per cent for that portion used for feed, seed, wastage or consumed in shelled form. Even if the farmer pounds his own corn it is reasonable to assume that an income is derived from this activity.

If the volume of shelled corn assumed to be milled in current estimates is compared with the value added by corn milling, the following results are obtained:

	1957	1958	1959
Volume of corn milled (Metric tons of shelled corn)	225,424	240,970	270,466
Value added by milling	18,991,675	14,368,397	7,254,943
Value added per metric ton	84.25	59.63	26.82
Value added per sack of 57 kilos	4.80	3.40	1.53

On the other hand, officials of NARIC informed us that corn is milled on a custom basis at a charge of 60 centavos per sack of 57 kilos. Thus, the above current estimates, in addition to being irregular in terms of cost of milling per sack of shelled corn, also appear to overstate the amount earned per sack. At least some of this overstatement arises as in the case of rice from difference between a farm price which is used to value the output of shelled corn and the wholesale price for larger cities which is used for valuing the by-products and finished products.

To sum up, I would recommend:

1. That it be assumed that 80 per cent of the total output of shelled corn is milled.

---

[1] Volume II, p. 97.

2. That the value added by milling be estimated at 60 centavos per sack of 57 kilos of shelled corn.

This method would be much simpler than the one currently in use and would be less subject to errors that arise through the use of different bases of price quotation. For example, the decline in value added for 1959 is due to the use of a five year average price in valuing the farm production of corn and a current year's price at the final product level. It should perhaps also be noted that through some error the wholesale price of shelled corn instead of milled corn was used in valuing the finished product.

While this basis of estimation fails to make any specific allowance for depreciation, this will be offset by the fact that the corn mills earn some income from storage.

ESTIMATION OF THE NATIONAL INCOME ACCOUNTS
BY THE OPERATIONAL PLANNING AND STATISTICS
CY 1956-1962

PROGRAM IMPLEMENTATION AGENCY

32

METHODOLOGY USED IN THE COMPUTATION OF P. I. A. NATIONAL ACCOUNTS

Since the Gross National Product can be arrived at in two different ways, either by the flow of income approach by which we measure the earnings of the different sectors of the economy or by the flow of products appraach in which we sum up the amount of money spent for the consumption of final goods, the description in the following paragraphs shall be divided into two parts, the first part describing how the income originating from the various industrial sectors was measured and the second part accounting in detail the manner in which the total money value of the flow of final products of the nation was estimated.

In the following paragraphs, the conversion of the GNP from current prices to 1962 market values shall be described not as an over-all procedure but shall be particularized in the treatment of each sector. This is due to the fact that the deflating procedures used in the different sectors of the economy were not totally the same for all.

1. Income or Earnings Approach:

In the estimates of the national income by industrial origin, the industrial sector was divided into eight classifications, namely: Agriculture, Mining, Manufacturing, Construction, Trade, Transportation and Communication, Government, and lastly, Services. These divisions are slightly different from the NEC groupings since the government services sector was included by the NEC in the Services group, accounting for the presence of only seven industrial sectors in the NEC National Income Accounts.

It is to be noted, however, that the sum total of all the income originating or value added from the eight industrial sectors make up only the Net Domestic Product at Factor Cost. Indirect taxes less subsidies plus depreciation has to be added to the Net Domestic Product or National Income at factor cost in order to get the Gross Domestic Product at Market Prices. The Indirect Taxes in current prices from FY 1959-62 were taken directly from the revised NEC estimates, except that the dollar margin fee collections were added to the NEC estimates for FY 1959-62. For the estimates of Indirect taxes at constant 1962 prices, the proportion of the indirect taxes to the Net Domestic product for 1962 only was taken and this rate was applied to all the years back, from 1956-61. The rate applied was 8.44%. The figures for depreciation were also taken directly from the NEC estimates for both current and constant prices. No changes were made. After getting the Gross Domestic Product, net remittances were subtracted to arrive at the Gross National Product. The dollar values of net remittances at current prices were taken from the Central Bank Balance of Payments. Their respective exchange rate for imports of each year to their dollar values. In converting the dollar values of the net remittances estimates from current prices to constant 1962 prices, the CB import price index rebased to 1962 was used. Their respective peso values were derived by applying the 1962 effective exchange rate for imports for all the years in review to the already deflated dollar values of Net Remittances.

I-A-1. AGRICULTURE

The Agricultural Sector by Category of Production in the National Income is divided into four major groups. First we have the total crop production which in turn is divided into food and commercial crops. As expected, this first sub-division accounts for about 50% or even more of the total Agricultural Production, Next group is the Livestock and Poultry Production which measures not only the Farm Marketing and Direct Consumption of livestock, poultry and their by-products namely eggs, milk and hides but also takes into account the value of change in inventory for the mentioned crops. Third heading is Fish Production and the last group is the production from Forestry. In the computation of the income originating from each of the four sub-divisions, different methods were used to arrive at the final figures. The following paragraphs will describe the processes used in computing the Value Added.

I-A-1a. ALL CROPS

i. Food Crops- Since the basic data were all on

Crop Year basis, the quantities and values were all adjusted to a calendar year basis. After the adjustments were made for each crop, their calendar year values were then multiplied by the corresponding value added ratios to get their value added. Value added ratio for all food crops was 98% except for Palay and "Others" whose value added ratio was 95%. Allowance was made for undercoverage which amounts to 3.54% of total crop production. The total Value Added of Food Crops plus the Undercoverage amount made up the final total for the Value Added of Food Crops. The data for food crops were all taken from the Crop and Livestock Statistics of the AED, DANR.

ii. Commercial Crops - For this sub-group, the same process as that utilized for food crops value added was used except for sugar and coconuts. With regards to coconut, the quantity was in terms of nuts and not in terms of metric tons as in the case of the other crops. To get the gross value of coconut, the quantity was multiplied by the unit farm value. To the result was applied the value added ratio of 98% to get the Value Added. The basic data for coconut were taken from the DANR Crop and Livestock Statistics except for 1956 and 1957 where the quantities were derived from the Copra Exporters Association. For sugar, two separate computations were done; one for centrifugal sugar, whose quantity of production was multiplied by the unit farm value to get the gross value. However, 49% of the gross value was subtracted to get the real net value received by the planters. The Net Receipts were then multiplied by the value added ratio of 81% to get the Net Value Added for Centrifugal Sugar. For "Other Sugar", the value added was derived by multiplying the sum of the gross value of Molasses, Panocha and Muscovado with the Value Added Ratio (81%). Except for the data on centrifugal sugar and a few others indicated whose basic source was the Sugar Quota Administration, the rest of the data on the commercial crops was taken from the DANR Crop and Livestock Statistics. The value added ratio for ramie, maguey, kapok and cotton was 95%; for coconut, copra and abaca, 98%; and for tobacco 91%. An undercoverage of 3.54% was included to get the total Value Added of Commercial Crops.

I-A-1b. LIVESTOCK AND POULTRY

i. Direct Consumption and Farm Marketing - This sub-group is further sub-divided into (a) Livestock and Poultry alone and (b) Eggs, Milk and Hides.

i-a Livestock and Poultry - First, the crop year quantities expressed in dressed weights were adjusted to a calendar year basis. However, there was a change in the method of adjustment. Since the crop year starts in March of the first year and ends in March of the following year, the calendar year quantities were derived by first getting 1/6 of both crop years; 1/6 of the first crop year from the sum of which was subtracted the computed 1/6 of the following crop year. When the calendar year quantities were derived, they were further adjusted to include allowance for undercoverage which varied for each livestock and poultry animals. The adjusted dressed weights were then multiplied by their respective unit prices to obtain the gross values which in turn were multiplied by the respective value added ratios to get the Value Added. Besides the undercoverage allowance for each animal, an additional ten percent of the total livestock value added was added to the total Value Added of Livestock and Poultry Consumption and Farm Marketing. Source of basic data was the DANR Crop and Livestock Statistics.

i-b. Eggs, Milk and Hides - The methodology for the computation of the value added for these three by-products is the same as that used in Livestock and Poultry except for the fact that there was no value added ratio so that the gross value became the actual value added. The gross values were derived by multiplying the adjusted volumes on a calendar year basis and with allowances for undercoverage with their respective unit prices.

The sum of the net value added of livestock and poultry and the net value added of eggs, milk and hides made up the total income originating from the Direct Consumption and farm marketing of livestock and poultry.

ii. Inventory Change in Livestock and Poultry - Since we are measuring here the value of change in inventory, the process of computing the value added of inventory change involves three crop years. To get the volume of inventory change two calendar years must be derived. To arrive at the inventory volume of the first calendar year, five sixth of the difference between the first two crop years is taken to which is added the total inventory volume of the first crop year. For the inventory volume of the second calendar year, again 5/6 of the difference between the second and third crop year is computed and to which is added the total inventory volume of the second year. The inventory change between these two calendar years is derived by just subtracting the inventory of the first calendar year from the inventory of the second calendar year. Once the inventory change has been derived, it is further adjusted to allow for undercoverage (they are noted in the tables).

The adjusted inventory change is then multiplied by the corresponding inventory price to get the gross value of inventory change to which is applied the value added ratio to get the value added figure.

With the value added of inventory change already computed for the Livestock and Poultry group is complete since it is equal to the sum of the value added of the Direct Consumption and Farm Marketing of Livestock and Poultry and their by-products and the value added of the change inventory.

Source of the basic data for all Livestock and Poultry sector was the DANR Crop and Livestock Statistics and the NEC for the unit prices of the Inventory changes.

I-A-1c. FISHING

The process of computing the value added for fishing is much the same as that used in getting the value added for food crops except for the fact that there was a change in the value added ratio used. The value added in fishing is a total of the Value Added in sustenance

3

fishing, fishponds and commercial fishing. Source of Basic data in fishing is the Fisheries Statistics of the Philippines published annually by the Bureau of Fisheries.

I-A-1d. FORESTRY

The Value Added figures for forestry were all taken from the NEC estimates without any changes introduced. However, in order to get the unit value added for each year for logs and lumber, the data on the quantity of logs and lumber production were necessary. Since these data were not immediately available from the NEC. we used the Central Bank time series data on logs and lumber production. The unit prices for logs and lumber production, particularly the 1962 unit value added was needed in the deflation of the current forestry value added to the 1962 constant prices.

It is to be noted too that the value of production, not the Value Added of forestry was not immediately available from the data gathered. As a result, we derived the Value of Production for CY 1956-62 at current prices by dividing the Value Added figures by the Value Added ratio of 97%. This ratio is constant for all years. This same procedure was utilized in deriving the value of production of forestry at constant 1962 prices after the value added estimates for CY 1956-1962 were deflated to constant 1962 prices.

Deflating Methods Used in Agriculture:

The procedure used in converting the current figures of each group in the Agricultural Sector to constant 1962 prices was the same for all groups. In short, the 1962 unit price of each agricultural product was applied to the quantity of production of each year from 1956-62 to get the value of production at constant 1962 prices. This was done in very great detail for each and every agricultural crop, product and by-products. Once the constant 1962 values of production were estimated, the same value added ratios corresponding to each crop, animal and other products were again applied to them to arrive at the final value added in agriculture at constant 1962 prices.

For the final estimate of agricultural production at both current and constant 1962 prices, 2.66%[a] of total Gross Value Added in Agriculture was subtracted to account for depreciation and factor income payments from abroad.

I-A-2 MINING

The procedure used in estimating the value added in mining at both current and constant prices is very much similar to the method implemented in the computation of income originating from Agricultural Production except for the introduction of a few modifications.

It is to be noted that cement production was excluded from the total value of mineral production for all years in current as well as constant prices. The reason for this is that cement production has already been reflected and included in the estimates of Manufacturing value added so that including it in the total value of mining would result in double counting. In the NEC estimates, cement was taken into account in the mining sector.

In getting the value added at current prices, a constant value added ratio of 65.5%[a] was applied to the value of production (exclusive of cement) for all years,

A similar procedure as the above mentioned was used in computing the value added at constant 1962 prices. The only addition was the conversion of the value of production from current to constant prices. Again, the deflating procedure utilized was exactly the same as that used in Agriculture, namely: the 1962 unit values of each product were derived and then applied to their respective quantity of production for each current year. The ratio used was the same. Source of the Mining data was the Bureau of Mines "Summary of Mineral Production".

---

[a] Taken from the IBRD report on National Income.

I-A-3 MANUFACTURING

Next to Agriculture and Services, the manufacturing sector occupies the third biggest item in Income Originating from the Industrial Sector. This third industry classification is in turn divided into four sub-groups: (a) Organized Manufacturing, (b) Rice Milling, (c) Corn Milling, and (d) Other Manufacturing. Of the four, the first sub-group accounts for approximately 89% of the total Manufacturing Sector.

I-A-3a ORGANIZED MANUFACTURING

It was pointed out in the beginning that the availability of new information and studies has prompted the re-estimation of the national accounts. This is very true in the case of the figures of organized manufacturing which is composed of the two-digit industries. The majority of this new information has come from the Survey of Manufactures, a reference not taken into account in the previous estimates of the GNP by the NEC.

For CY 1956-1960, the computation of the gross value added at current prices "Manufacturing Proper" was based on the new data taken from the Survey of Manufactures which has covered, so far, only the years from 1956-60. The Gross Value Added for each of the first four years was computed by first estimating the Value of Production which is equivalent to the total Manufacturing receipts plus total Net Changes in Inventory. From the Value of Production was subtracted the Cost of Raw Materials, fuels, containers electric power consumed and the contract work performed by others to get the Gross Value Added (including depreciation which was computed for each year from the data provided for by Survey of Manufactures).

For the Net Value Added for 1961-1962, the Value of Production was first derived by extrapolating it from the Central Bank Value Index while the volume of production was extrapolated from the CB Volume Index and the corrections mady by the World Bank. To the Value of Production was applied the Value Added ratio taken from the Central Bank too.

The process of computing the depreciation at both current and constant prices for all year, the method of extrapolation and the delating procedures for all the years are explained lengthily and in detail in the write up and analysis of Manufacturing Proper.

I-A-3b RICE AND CORN MILLING

Concerning the estimates of the Value Added in rice and corn milling, only one method of estimation was employed for all the years in review. For the value added in current prices, the figures were directly taken from the revised NEC estimates. However, since there were no figures of rice and corn milling at constant prices, it was necessary to compute for the value added at constant 1962 prices.

In computing the value added at constant prices, the quantity of milled rice and corn had to be computed first since such data were not immediately available. To do so, we first derived the crop year production of palay and corn (shelled) as reported by the DANR-AED and converted them into calendar year basis.[b] From the total quantity of palay and shelled corn produced were deducted some allowances for the amount of palay and shelled corn not milled either by households or by milling centrals. These allowances covered seeds and wastes, animal feeds and corn used as a raw material in the production other industrial products such as starch etc. For rice, the allowance used was 5.1% of total Palay produced. With their respective allowances subtracted from the total production of palay shelled corn respectively, the remainder composed the palay and corn available for milling. Furthermore, recovery ratios were applied to both the rice and corn ready for milling in order to get the actual amount of rice and corn finally milled and processed. 68% was used as the recovery ratio for rice and 90% was the ratio applied to corn.

As soon as the volume or quantity of milled rice and corn was estimated for the respective years, the unit value added was derived for 1962. The derivation of the 1962 unit value added, which consisted of merely dividing the current price series was important in order to get a constant price by which to multiply the quantities of value added for milled rice and corn all at 1962 prices. The whole procedure can be summed up in the following formulae:

---

[b] Consult the Notes on Agricultural Food Crops.

(a) Rice: VA_{1962} = Palay Production - 5.1% = Palay ready for milling

= 68% of palay for milling = milled rice volume

= Q of milled rice X 1962 unit value added

(b) Corn: VA_{1962} = Shelled Corn - Q-35.7% = Corn ready for milling

= 90% of Shelled corn for milling = Volume of milled corn

= Q of milled corn X 1962 unit value added.

It is to be noted that it was necessary to compute the unit value added and not the unit value or price of production in the above formulae since we would arrive at the same value added at constant 1962 prices whether we first solved for the value of production to which would be applied the value added ratio or whether we applied the unit value added at 1962 to the quantity. The main reason for this is the fact that the value added ratios for rice and corn respectively are the same for all years.

Also worth noting is the fact that sugar milling was not included in the manufacturing sector mainly because it has already been reflected in the Agricultural sector.

I-A-3c OTHER MANUFACTURING

This sub-group refers to the other manufacturing establishments not accounted for in the "Organized Manufacturing" group. The most plausible explanation given for this separate classification is that "manufacturing" as defined in the Survey of Manufactures accounts for only about 250,000 workers and only this number is accounted for in the "Organized Manufacturing" group. However, the PSSH labor force definition of manufacturing includes 1,170 thousand workers, thus showing that a relatively sizable magnitude is not accounted for and that a sizable amount of value added derived from outside organized manufacturing has been excluded but must be accounted for in order to present a real picture of the income originating from the Manufacturing Sector. Included in the "Other Manufacturing" group are embroidery, which accounts for more than 50% of the total, small furniture establishments, tailoring and haberdashery shops, etc.

The figures for "other manufacturing" value added at current prices were directly taken from the NEC estimates. However, the value added figures at constant prices had to be derived by applying the Central Bank wholesale price index for exported products, particularly for miscellaneous manufactured products not elsewhere classified to the estimates at current prices. The wholesale price index for export products was chosen as the deflator because the embroidery industry which produces largely for exports accounts for more than one-half of the "other manufacturing" group.

I-A-4 TRADE

Total income from trade at current prices was estimated by computing for a trade mark-up of each year from 1956-1962 to the combined total of the gross value of production at current prices of the agricultural and manufacturing sector plus the indirect taxes (inclusive of subsidies), imports of CIF values and the margin fee which was introduced in 1959 and is still applied up to the present.

For the total income from trade at constant 1962 prices, only the 1962 trade mark up was applied to the yearly (1956-62) gross value of production of the same items mentioned above.

Since the latest available estimate of trade mark-up was that of 1957, all the other trade mark ups from 1958 up to 1962 were extrapolated with a 1957 base by means of a composite trade mark up index.

The trade mark-up index is a composite of the wholesale trade index (which is also composite) and the retail trade index. In formula form, the trade mark-up index can be expressed thus:

Trade Mark-Up Index = Weighted average of the composite wholesale trade index 1957 = 100 and the retail trade index 1957 = 100

Weights used were: 37%[c] for composite wholesale
63%[c] for retail

Retail Trade Index:

In a very short formula, the retail trade index can be illustrated thus:

$$\text{RTI 1957} = 100 = \frac{\text{Weighted Retail Trade Index 1957} = 100}{\text{Weighted wholesale Trade Index 1957} = 100}$$

The weighted retail trade index was derived first by getting the implicit price indices of food consumption, beverage and tobacco, clothing, household durables, construction, and business equipment. The procedure was nothing but dividing the current values[d] of the items by their respective constant 1962 values.[d] A weighted average of the derived implicit price indices for the above mentioned items was then computed for to arrive at the weighted retail trade index at 1962 = 100 which was rebased to 1957.

The same procedures as explained in the preceeding paragraph was applied to the Central Bank Home Consumption Wholesale Price Indices in Manila rebased to 1957 for the same items enumerated above to get the weighted wholesale trade index at 1957 = 100.

---

[c] Derived by getting the percentage of retail trade and wholesale trade to the total income from trade in 1957 = the benchmark for all trade estimates from 1958-1962.

[d] The procedure in deriving these values are explained in detail in the section treating on private consumption expenditures.

The final retail trade index was then computed for by getting the ratio of the weighted retail trade index to the weighted wholesale trade index for all years from 1956-1962 using the benchmark year of 1957 as the base.

Composite Wholesale Trade Index:

This index is so-called because it is composite of the domestic wholesale index (76.59%)[*] the import wholesale index (14.13%)[*] and the export wholesale index (9.28%)[*].

The Import Wholesale Trade Index was arrived at by getting the ratio of the Wholesale Price Index of Imported Products to the Index of Landed Import Cont. Both indices, which were taken directly from the Central Bank Statistical Bulletin, reflect the income from import trade.

Since the Domestic Wholesale Trade Index is the ratio of the Central Bank Wholesale Price Index of Domestically Produced Products for Home Use to the Producer's Price Index for Domestic Products, the latter index had to be set-up first. The producer's price index is no other than the implicit price deflator of the total gross value of production in agriculture, mining and manufacturing. The only thing needed to do was divide the total values from 1956-1962 at current prices by their respective values at constant 1962 prices.

Finally, the export wholesale index was derived by getting the ratio of the Implicit Price Index of Exports [e/] to the Derived Producers Price Index from Commercial crops and mineral production.

All the indices above which went to the final computation of the Composite wholesale price index are all based at 1957 = 100.

---

[*] These weights are the same as those used by the Central Bank in the computation of the wholesale price index for all items.

[e/] Derived from the Current Value of exports divided by quantum exports.

The import wholesale index, the export wholesale index and the domestic wholesale index multiplied with their respective weights give the final composite wholesale price index for each year from 1956-1957.

With the Composite wholesale price index and the retail trade index computed, the trade mark-up index was then derived by just getting their weighted average.

The Trade Mark-up index 1957 = 100 was then applied to the 1957 trade mark-up to extrapolate for the trade mark-ups for 1958 to 1962 which were in turn applied to the Total Gross Value of Production of the sectors and items listed in the beginning of the notes on the trade sector to arrive at the total incomes from trade at current prices. Total income from trade at constant 1962 prices for 1956 to 1962 was derived by just applying the 1962 trade mark-up to the total value of production mentioned previously.

I-A-5 CONSTRUCTION

In computing for the value added from construction, the same basic formula (V x V.A.R. = V.A.) was used. However, there was a need to readjust the value of construction since the studies made by the World Bank and by other national income experts on our official National Income accounts have pointed out the fact that previous estimates on the value of construction have always been underestimated, resulting in the understatement of value added. Residential construction, in particular, has been understated mainly to the non-inclusion of non-owner occupied dwellings.

On construction, newer and more up-to-date data and information concerning its production value have become available so that more realistic figures have been made possible to arrive at. Total value added in construction is composed of the income originating from residential construction; non-residential which embraces the construction done in manufacturing, agriculture, mining utilities and trade and services; land development, and lastly, government construction. The data for the value of residential construction at current prices from 1956 to 1961 were taken from the "IBRD MIssion Estimates on Housing". The 1962 estimates were arrived at by extrapolation, making use of the Central Bank Value Index of construction materials. Table XI-A-1 shows in detail the process of extrapolation.

For the non-residential construction value for CY 1956-1960, the data on manufacturing at current prices were also taken from the Survey of Manufactures, the figures for agriculture and mining utilities from the IBRD report, and the trade and services estimation from the Philippine Journal of Statistics. For 1961 and 1962, the IBRD report combined manufacturing, agriculture and mining utilities to form industry and utilities group which was then added to trade and services to constitute the total value of non-residential construction for 1961 and 1962.

With regard to land development, the values for CY 1956-1962 at current prices were estimated by getting the annual increases in hectarage for each of the years covered and the resulting absolute yearly increase were multiplied by the current unit price or value per hectare.

The government construction values were lifted straight from the GAO Annual reports. No changes were introduced nor were there any modifications added.

As mentioned, the value added at current prices was derived by just applying the value added ratio of 67% to the value of production. To get the constant 1962 value added, however, the value added at current prices was deflated by the Central Bank retail price index for construction materials rebased to 1962.

I-A-6 TRANSPORTATION

Not much change was added to the data on income from the transportation sector except for the re-deflation of the current estimates to 1962 prices. Since estimates on transportation value added from 1956-1962 were available in both current and constant 1955 prices, implicit price deflators (1955 = 100) were computed for and were later rebased to 1962. The implicit deflators rebased to 1962 were then applied to the NEC current prices to get the value added in construction at constant 1962 prices.

GOVERNMENT

In the National Income estimates by NEC, this sector does not have a separate classification but is included under Services. Also, estimates on government value added at both current and constant prices have been completely revised. In the revised figures, the value added estimates at current prices include only salaries and wages, life and retirement insurance premiums, plus salary increases in the national and local governments, exclusive of government-owned or government controlled corporations. All remunerations from goods and services originating from government or public corporations were intentionally left out since they had already been reflected in each of the other sectors' value added.

The method of deflating the current price series of government value added was also revised due to an inconsistency in the NEC deflation procedures pointed out in the IBRD report. Up to 1957, the NEC had been deflating their current price on government by means of a price index. However, from 1958 to the present, they shifted to extrapolation on the basis of employment data, thus accounting for the inconsistency. As a result, therefore, the procedures suggested by the IBRD was implemented that is, the current value series of salaries and wages were taken from which were deducted the budgeted amounts allowed for pay increases in the period and the resulting values rebased to 1962 to get the value added from government at constant 1962 prices. Sources of all the basic data on government services were the annual reports of the GAO for the years covered.

I-A-8 SERVICES

In this sector's value added, the NEC estimates on services, now excluding government, were used for both the current and the constant price series. In short, the NEC series on Services value added at current prices was divided by their constant 1955 price series to get the implicit price deflator for each year. The deflators, rebased to 1962, were then multiplied to the estimates at current prices, the result being the incomes originating from series at constant 1962 prices.

Services included in this sector are personal, recreational, educational and professional services, and also the rental value of owner-occupied dwellings and other service industries not elsewhere classified.

The total value added from all the eight industry classification treated in detail in the preceeding paragraphs constitute the National Income by Industrial Origin.

II - FLOW OF PRODUCT APPROACH

This approach used in estimating the Gross National Product (Expenditures) is composed of adding all together, for each year, the consumption expenditures of households and private corporations; the current expenditures incurred by the national and local governments including government owned and controlled corporations; the gross domestic investments, consisting of the investments of both the private and public sectors on construction and durables as well as net changes in inventories; and lastly, the net exports which is the differences of total exports of goods and services less total imports. The sum of all the expenditures in the sectors and items listed above make up the Gross Domestic Product at Market Prices from which is subtracted net remittances[f] from abroad to arrive at the Gross National Product. The GNP derived from this approach must always equal the GNP arrived at in the previous approach described as the flow of income approach.

The following paragraphs describe in detail the method by which the GNP was arrived at by the flow of product approach.

II-A PRIVATE CONSUMPTION EXPENDITURES

Private consumption expenditure is a residual item computed by deducting government current expenditures, gross domestic investment and net exports and investment income from Gross Domestic Product. An improvement in the NEC estimate is the breakdown of the total into more detailed expenditure items. Direct estimates of consumption of food, beverages, tobacco, clothing, shelter and durable household goods were made. The miscellaneous portion of the consumption expenditures accounts is the difference between the sum of the items enumerated in the succeeding paragraphs and total private consumption expenditures.

---

[f] Consult the notes on the flow of income approach for the derivation of net remittances.

49

NA-VI REST OF THE WORLD ACCOUNT

All the dollar values of the components of Total Current Receipts namely, exports of goods and services, net factor income and net donation were available from the Central Bank Balance of Payments. All these dollar values were first converted to pesos at a unitary exchange rate - the prevailing effective import exchange rate, after which their peso values were added together to get the total peso value of Total Current receipts.

For total current payments, the import dollar values were taken from the Central Bank and were converted to pesos at the same exchange rate used for the dollar values of exports, net factor income and net donations. Net lending was a residual item derived by subtracting the import peso values from the peso values of total current receipts.

II-A-1 FOOD

Food is the biggest item of expenditure accounting for about 50% or more of total private consumption. This is subdivided into the following items:

(a) Farm Crops - Crop year estimates of quantity and value of production were compiled from publications of the DANR, These were converted into calendar year estimates by averaging two succeeding crop years. A 10% allowance for farm use was deducted to get the value of crops available for consumption. The mark-up percentages were computed by extrapolating the 1959 mark-up, which is given in "Savings in the Philippines" by Hooley, on the basis of mark-up index of palay, corn and other crops.

(b) Livestock - The value of livestock and poultry consumption is the same as that used in computing the income originating from Livestock and Poultry Consumption. The procedure used in computing the values has been described in the first part which treats of the estimates of value added for livestock and poultry.

(c) Fish - Data on quantity and value of fish production were taken from the fisheries statistics. A fixed 39.1% mark-up was added to arrive at the value of consumption.

(d) Net Imports of Food Manufactures Excluding Sugar - The import and export dollar values of food manufactures were obtained from the Central Bank Statistical Bulletin. These were converted into pesos by applying the exchange rates shown in Table XV-A-1d. Net imports is the excess of imports over exports. The markup percentages used to derive the total value of net imports were also taken from "Savings in the Philippines."

(c) Net Value of Food Manufactured - Statistics on value of food manufactures sold and the cost of raw materials net of rice and corn milling for the period 1956 to 1960 were obtained from the survey of manufactures. Figures for 1961 and 1962 were extrapolated based on value index of output with 1960 as base year. To get the value added, the cost of raw materials was deducted from the value of products sold. Net value of food manufactured is derived by applying markup percentages to value added.

(f) Coconut - Data on the quantity of copra consumption from 1956 to 1961 were furnished by the Copra Exporters Association. The 1962 figures for home made oil and nuts consumed at home were extrapolated based on index of coconut production. The quantity of manufactured oil domestically consumed for 1962 was supplied by the PHILCOA. The value of manufactured and home made oil was computed by multiplying the quantity of copra consumption converted into oil by the Central Bank wholesale price of oil. For nuts consumed at home the farm price was used. The sum of the three items represents total household consumption of coconut.

(g) Sugar - Domestic sugar consumption is composed of centrifugal sugar, molasses, muscovado and panocha including their respective mark-ups. The Sugar Quota Administration supplied the data on centrifugal sugar consumption. The farm value of "other sugar" production which was taken from the DANR, is assumed to be equal to their consumption value.

II-A-2 BEVERAGES AND TOBACCO

Consumption of beverages and tobacco consists largely of the value of products sold. The data for this sub-sector was available only for 1956 up to 1960 from the Survey of Manufactures. The 1961 and 1962 figures were extrapolated on the basis of their respective value indices with 1960 as the base year. To this were added net imports and taxes collected which were published in the Central Bank Statistical Bulletin and the BIR reports. A straight markup of 20% was applied. Expenditures for the two items for the period 1956-1959 were also compiled directly from Hooley's "Savings in the Philippines".

II-A-3 CLOTHING

The same procedure of estimating beverage and tobacco consumption was used to arrive at household expenditures on clothing. The only difference was in the subtraction of cost of raw materials from the value of products sold.

II-A-4 HOUSEHOLD DURABLES

The Survey of Manufactures has provided more information on the value of durables sold. The amount for 1961 and 1962 were extrapolated on the basis of value index of output. The value of durables used for capital formation was deducted to derive the household expenditures on durables. Imports and exports of selected household durables were obtained from the Central Bank Economic Research Division.

II-A-5 SHELTER

The imputed net rental value of owner occupied dwelling was taken from the national income accounts as published by the NEC.

II-A-6 DEFLATING PROCEDURES

The implicit price deflator for total consumption expenditures was arrived at by dividing the current value by the constant value, which is also a residual. However, the individual consumption items were deflated separately. "Miscellaneous" accounts for the difference between the sum of these deflated values and total consumption expenditures at constant prices.

The value of farm crops at 1962 prices was computed by multiplying direct estimates of consumption quantities by their 1962 unit prices and applying the 1962 markup. The same method was adopted in deflating other food items where consumption quantities are available. The net value of food manufactured was deflated by the wholesale price index of domestic products. For net imports of food manufacture, the first step was to deflate the dollar values of imports and exports by the wholesale price index of imports and exports of food. The 1962 exchange rates were then used in converting these values into pesos. Current consumption values of beverages, tobacco and household durables were deflated by their respective retail price indices rebased at 1962. For clothing and shelter, the consumer price index was used for the deflation method.

II-B GOVERNMENT CURRENT EXPENDITURES

Current expenditures of the government refer to all the expenses incurred by general government (national and local) during each calendar year. It is subdivided into (a) salaries and wages which also includes fringe benefits enjoyed by employees as well as life and retirement insurance premiums; and (b) "others" - which takes into account the goods purchased and services rendered such as travelling, communication and transportation services, repair and maintenance of facilities, etc.

The derivation of the estimates on salaries and wages at both current and constant 1962 prices have been discussed in the section on value added in the Government Sector.

Expenditures on goods and services at current prices were directly compiled from the fiscal year reports of the General Auditing Office converted into calendar year estimates. The deflated estimates were derived by applying the Central Bank wholesale price index for home consumption rebased to 1962 to the estimates of government expenses on goods and services at current prices.

The sum of the government payment on salaries and wages plus the expenses incurred on goods and services make up the total annual value of government current expenditures.

II-C GROSS DOMESTIC INVESTMENTS

Otherwise known as gross capital formation, this sector represents the gross value of goods added to the domestic capital stock in the country. It consists of the expenditures by the private and public (general government and government corporations) sectors on new fixed assets like durable equipment and construction plus the value of change in inventories. A detailed description of the estimating procedures used in this sector is presented lengthily in the following paragraphs.

II-C-1 DURABLE EQUIPMENT

Gross Investments on Durable Equipment consist in expen-- ditures on locally produced durables and on imported durable equipment which go either directly to producers, or indirectly, that is, through dealers, plus the respective trade mark-ups for each year.

The current year esetimates of imported durables were directly compiled from the World Bank files. The original values were expressed in terms of CIF values converted into pesos at ₱2 to $1 exchange rate for all years. Of the total values of imported durables, 40% was attributed to imports made through dealers while 60% went to imports that went directly to producers. This percentage was derived from the IBRD report and was applied to all the years covered.[f] Furthermore, import duties amounting to a constant 21%[f] of the value of imported durables through dealers only were computed for and added to the import values.

---

[f] Taken from the report of Ruben Trinidad.

54

Since the original import values were all converted at the same rate of P2 to $1 for all years and in order to get a true value of the imported durables it was necessary to include the effective markup brought about by the implementation of the margin fee law in 1959 and the changes in the effective exchange rates.

The complete procedure for arriving at the effective mark-ups for the margin fee and the changes in foreign exchange from 1959 to 1962 consisted of five steps. First of all, the CIF dollar values of total imports of goods and services were multiplied by the current import exchange rates. Secondly, the same original CIF dollar values of imports were multiplied by P2. Next step was to get the difference between the values converted at the current effective exchange rates and at P2 to $1. For the fourth step, the resulting difference was then divided by the peso values derived in the second step to get the relative increase (in per cent) generated by the increase in exchange rates. The percentages derived for each year (from 1959-1960) were then added to the corresponding margin fee rates. The resulting sum computed for each year was the per cent markup for margin fee and the changes in effective exchange rates. Each of the per cent markups arrived at were then applied to the respective values of imported durables from 1959-1962.

The figures for investments on locally produced durables for 1956 to 1960 were estimated by applying constant ratios to the total manufacturing receipts g/ of (a) machinery except agriculturals and electrical (68%)*, (b) Agricultural machinery (87.5%)*, (c) Electrical machinery (48.3%)*, (d) Transport equipment (20.0%)* and Miscellaneous Manufactures (25%* hand tools and 20%* for musical instruments).

---

g/ Source: Survey of Manufactures (1956-1960)

* Ratio applied: These ratios were obtained by getting the proportion of the value of each durable equipment group (grouping presented above) as computed by the IBRD for 1956 to their respective value of production as estimated by PIA also for 1956. These ratios, although actually for 1956 only, were applied to all the ensuing years.

The estimates for 1961 and 1962 figures at current prices of locally manufactured durables were extrapolated by using a value index computed from the Central Bank Index of Physical Volume of Production and the Wholesale Price Index of Imported Products. Table XVI-A2-1 shows the detailed computations of the value index used.

After computing for the total investments on durables both local and imported, a trade mark-up was computed for each year from 1956 to 1962. For imported durables direct to producers and for locally manufactured durables, it was assumed that the trade mark-ups was 30% across the board, However, the trade mark-ups on durables imported through dealers had to be computed for, deriving the benchmark estimates from a survey conducted by NEC on February 3, 1960. Although the resulting trade markups derived from the mentioned survey were used by Mr. Trinidad in his estimate of capital formation for 1956, the mark-ups, however, were probably applicable during 1959 and early 1960 and to that extent may have already reflected partly the effects on costs of the margin fee on purchases of foreign exchange. On this assumption, mark-ups were extrapolated only for 1959 to 1960 through the use of the wholesale price index of imported durable equipment derived from the Central Bank Statistical Bulletin. For the years from 1956 to 1958, the trade mark-ups computed by applying the mark-up percentages already estimated by the IBRD mission. From 1961 to 1962, extrapolation had to be resorted to once more, this time, however, making use of a new index[h/]. First of all, a foreign export price index (1960 = 100) was derived by getting the average of the export price indices of the United States, United Kingdom and Japan for 1961 and only of the U.S. and Japan for 1962. The index just computed for was then used as the divisor of the Domestic Wholesale Price Index of Imported Machinery and transport equipment (also at 1960 = 100) to arrive at the Index of Domestic mark-up on imports for 1961 and 1962 with 1960 = 100 which was in turn applied to the 1960 mark-up percentage already derived to get the 1961 and 1962 per cent mark-up used in arriving at the extrapolated 1961 and 1962 trade mark-up.

The derivation of the trade-mark-ups provides the last stage in the estimation of total investments on durables at current domestic prices for 1956-1962.

[h/] Refer to Table XVI-A-2a-1.

II-C-1a DEFLATION OF DURABLES

In estimating the total investments on durables at constant 1962 prices, various deflators were used. First of all, the wholesale price indices for machinery and equipment at 1962 = 100 was applied to the current year factory value of locally manufactured durables to get the value of investments on locally manufactured durable equipment at constant 1962 prices. The total CIF values of directly and indirectly imported durables were deflated by means of the import price index rebased to 1962. For the mark-up values, 30% was the mark-up percentages applied to the deflated value of locally manufactured goods, while 270% was used as the per cent mark-up for the deflated CIF values of imported durables through dealers. Lastly 147% was the mark-up of percentage applied to the C.I.F. value of imported durables at 1962 prices.

The total CIF value at 1962 prices of all imported durable equipment (direct to producers and through dealers) plus the deflated value of locally manufactured durables including the 1962 mark-up values were all added up to get the total investments on durables at constant 1962 market prices for 1956-1962.

II-C-2 CONSTRUCTION

The values for total investments on Construction for 1956 to 1962 at both current and constant 1962 prices were the same values used in the computation of the value added from construction. The only difference is that the value added ratio was applied to the value of construction in order to get the amount of income originating from construction. Since, in this sector, our sole purpose is to derive only the capital formation in construction, there is no need to apply the value added ratio but to use only the values of production as computed. The procedures used in estimating the value of construction at both current and constant prices have been described in detail in the sector treating on value added from Construction.

Net Changes in Inventories

Total Net Changes in Inventory at both current and constant 1962 prices were derived by estimating separately the values of the net changes in inventory derived from

Agriculture, Mining, Manufacturing, Construction, Utilities, Transportation, Trade Services, and Government.

Agriculture

Net changes in inventory of livestock and poultry, centrifugal sugar and other agricultural crops (including grains), make up the total for Agriculture's net inventory change.

Livestock and Poultry

The values of the net change in inventory for both current and constant 1962 prices had already been computed for in the esetimation of value added for livestock and poultry in the section on income originating from agriculture. The same derived values (before the application of the value added ratios) were taken and used as the figures for net changes in inventory for livestock and poultry at current and constant prices. The derivation of these values have been described lengthily in the section treating on Value Added from Agricultural Production.

Sugar

Net changes in stocks for centrifugal sugar production from 1956 to 1962 at current prices were estimated by subtracting the value of total withdrawals of centrifugal sugar from the total value of production. The value of total withdrawals was derived by adding the peso values of sugar exports [1] and the values of domestic consumption. Data on sugar exports were compiled from the Central Bank figures for both the price and quantity of the domestic consumption and value of production of centrifugal sugar were taken from the Sugar Quota Administration.

---

[1] FOB values were expressed in dollars in the CB report so that they had to be converted to peso values. The exchange rates applied are enumerated on footnotes of Table XV-A.1h.

In estimating the deflated value of net changes in stocks of centrifugal sugar, a weighted unit price of exports and domestic consumption was derived for 1956-1962 and the derived 1962 unit price was applied to the current year quantities of changes in stocks. (The quantity of stock changes was derived by subtracting the quantity of centrifugal sugar produced from the quantity of total withdrawals)[1]

II-C-3a-3 OTHER AGRICULTURAL CROPS

The 1956 figure for net changes inventory of this sector was directly taken from Ruben Trinidad's 1956 survey in capital formation in agriculture. With the 1956 estimates as a benchmark, the 1957-1962 estimated current prices were extrapolated by deriving a stock-production value ratio which was used in all the succeeding years. This ratio was derived by getting the proportion of the ending stocks of crop year 1956 (as reported by Ruben Trinidad) to the value of production of crop years 1955-1956 (data from the DANR) and was applied to the crop year production values from 1957-1962 to derive the value of the ending stocks of each of the succeeding years. The ending stock of one year became the beginning inventory of the following years. However, to get the net change at current prices (not book value) the beginning inventory at current prices was first derived by deflating the original beginning inventory figures. The deflators were derived by dividing the gross value added for agricultural production in current prices by their respective value added at constant 1962 prices. Since the deflators were based at 1962 prices and since the beginning inventories at current prices were being derived, the deflators were all rebased to each current year. After arriving at the beginning inventory at current prices, the ending stock of each year was subtracted from it to get the net change of inventories of other agricultural crops at current prices. Their corresponding values at constant 1962 prices were derived by deflating the current year series with the price index mentioned above now rebased to 1962 = 100.

---

[1] Quantity of total withdrawals was derived by adding the quantity of domestic consumption (SQA) to the quantity of exports (CB).

II-C-3b MINING

The 1956 and 1957 current estimates of the value of net changes in inventory for mining were directly taken from the estimates of Ruben Trinidad and the 1957 figures were used as the benchmark for deriving the inventory/production ratio which was in turn used in extrapolating the values for 1958 to 1962. The derivation of both the inventory/production ratio and the net change in inventory at current prices followed the same procedures used in computing the values of net change in inventory of "other agricultural crops". In the case of mining, however, the implicit price deflator of mineral production at current prices over the mineral production value at 1962 prices was the deflator used. By and large, in the values used for mining, the values for cement, gold and silver were excluded. The over-all procedure may be summarized in the following formula:

(a) Inventory/Production Ratio = $\frac{\text{Ending stock of benchmark year}}{\text{Value of production of benchmark year}}$

(b) Ending stock of succeeding years = Derived Inventory/Production Ratio X value of production of succeeding years

(c) Beginning Inventory at current prices = $\frac{\text{Beginning Inventory at Bk. value}}{\text{Deflator rebased to corresponding calendar year}}$

(d) Net change in inventory at current prices = Beginning inventory at current prices less ending inventory

(e) Net change in inventory at 1962 prices = $\frac{\text{Net changes at current prices}}{\text{deflator rebased to 1962}}$

II-C-3c TRADE

For this sector, the same procedure summarized in the mining sector was used. Also the 1956 and 1957 estimates of Trinidad on the Trade Inventory net change were directly taken and his 1957 estimate was used as the basis of extrapolating the 1958 to 1962 current figures. For deflation, the general wholesale price index rebased to 1962 to the estimates at current prices of the net change in inventory.

II-C-3d GOVERNMENT

II-C-3e CONSTRUCTION

II-C-3f UTILITIES

II-C-3g TRANSPORTATION

The basic data on beginning and ending inventory at book value (for the last three sectors above were compiled from the financial statements of government corporations). The basic data for general governments were taken from the GAO annual reports. Since both the beginning and ending inventories at book values were available, only the beginning inventories at current prices were computed for by means of price deflators. For construction, the retail price index for construction materials rebased to each current year was used. For utilities and transportation, and government, the General Wholesale Price Index was applied. The same procedure used in deriving the value of net changes in inventory for mining was also used in deriving the net changes for these four sectors. Their respective values at constant 1962 prices were derived by applying the price deflators above mentioned to their net changes in inventory at current prices.

II-C-3h SERVICES

No estimates were done on the services sector because there is no possible way of computing for net changes in services. Only net changes in the inventory of goods are measurable.

II-C-3i MANUFACTURING

The book values of the beginning and ending inventories were available for the years from 1956 to 1960 from the Survey of Manufactures. However, the 1961 and 1962 estimates of the beginning and ending book value inventories were extrapolated by means of an inventory/production ratio. (Derived in the same manner previously described). In converting the book value of the beginning inventories to current prices to get the replacement cost two sets of derived deflators were used, one for 1956-1960 and another from 1961 and 1962. The deflator for 1956-1960 was a composite price deflator based on the manufacturing price index implicit in the Central Bank - IBRD physical volume index (See notes on manufacturing proper) and on another composite index which was in turn derived from the unit price of imports and the wholesale price index for crude materials (this second composite index being weighted according to the 1956 composition of purchased inputs = .6075 for domestic and .3925 imported).

The deflator for 1961 and 1962 was a derived average index weighted by a composition of manufacturer's inventories in 1960.

From the derived beginning inventories for 1956 to 1962 at current prices were then subtracted the ending inventories at book value to arrive at the net change in inventory for 1956-1962 at current prices.

The net change, however, at constant 1962 prices was deflated by an implicit price index derived by dividing the value of manufacturing at current prices by the constant 1962 price series.

II-D NET EXPORTS AND INVESTMENT INCOME

Since the dollar values at current prices of exports, imports and net investments income were available from the Balance of Payments Summary of the Central Bank, the peso values at current prices were derived by just converting the dollar values into pesos at a unitary exchange which was the prevailing effective import rate of each year. The import exchange rate was applied to both export and import values. The current values of net exports were derived by getting the difference between the export and import values.

In deriving the values of net exports at constant 1962 prices, their current dollar values were first deflated by the price indices rebased to 1962 for external trade which were available from the Central Bank Statistical Bulletin. The price index for exports was used to deflate the current values of merchandise and non-factor services and of investment income were all deflated by the import price index. The deflated dollar values were then converted into pesos by the use again of a unitary exchange rate -the 1962 effective import exchange rate.

III-6 ASPECTS OF THE NATIONAL ACCOUNTS

The National Income may be viewed from six different aspects, each presenting a different accounting procedure. They are (1) the National Income and Products Account; (2) Household Appropriation Account; (3) Corporate Appropriation Account; (4) Government Appropriation Account; (5) Combine Capital Account; and (6) Rest of the World Accounts.

For our puroses, only the current estimates of these 6 types of accounts were derived. The following paragraphs present in detail the method of arriving at these different accounts.

NA-I NATIONAL INCOME AND PRODUCTS ACCOUNT

To arrive at the National Income at factor cost, the National Income by distributive shares had to be computed first.

NA-I-A NATIONAL INCOME BY DISTRIBUTION SHARES

The four items that make up the National Income at factor cost (NNP at factor cost) are (a) compensation of employees, (b) entrepreneurial and Property Income of persons, (c) Private Corporate Income and (d) Property Income of Government. The figures for the last two items were directly compiled from the NEC revised estimates. The first two items were derived by first getting the income from unincorporated profits which was the residual derived after subtracting the last two items from the NNP at factor cost. The National Income at factor cost was in turn derived by subtracting the indirect taxes and depreciation both at current prices from the current price series of the GNP. 56% of the income from unincorporated profits went to Entrepreneurial and Property Income of persons while 44% was attributed to the compensation of employees (Percentages were taken from the NEC).

The values of both the Compensation of Employees and Entrepreneurial and Property Income of persons were further subdivided into (a) Agricultural and (b) Others. The values for compensation of employees from agriculture were derived by taking 28% of income originating from agriculture; for entrepreneurial and property income of persons from agriculture, 78% of agriculture's value added was taken. "Others" was nothing but the residual taken by subtracting the derived agriculture values from the respective totals of the Compensation of Employees and the Entrepreneurial and Property Income of Persons.

The five items of the National Income by Distributive shares, when added together, make up the National Income at factor cost to which are added the Indirect taxes and Depreciation values to get the GNP at current market prices - accounting for the income side of the National Income and Products Account. The values for the product or expenditure side have been computed for (as described in the beginning on the methodology on deriving the GNP at current prices.)

NA-II HOUSEHOLD APPROPRIATION ACCOUNT

The income side of this account is the same total of the value for compensation of employees, entrepreneurial and property income of persons, transfer payments and net donations from abroad. The first two items have been derived. The values for the second item were directly compiled from the NEC accounts and the net donations values for private sector were taken from the Central Bank Balance of Payments (consult Rest of the World Account)

For the outlay side, the household consumption expenditure value have been estimated. (Already described), the values for direct personal taxes were directly compiled from the NEC accounts and "Personal savings" was derived residual taken by subtracting the total of the first two items (consumption expenditures and taxes) from the total of Personal Income in the income side.

NA-III CORPORATE APPROPRIATION ACCOUNT

Total corporate income is equal to the undistributed corporate income plus the undistributed income of Government corporations. The data for both were directly compiled from the NEC estimates of the National Accounts.

The total corporate outlay was derived by adding the values of direct corporate taxes (figures from the NEC) and net corporate savings, a residual item.

NA-IV GOVERNMENT APPROPRIATION ACCOUNT

The total estimate of Government receipts was derived by taking the sum of indirect taxes net of subsidies plus direct taxes and the net donations from abroad for the government. The figures for indirect taxes were the same as those computed and used in estimating the GNP at current prices. Values of direct taxes were compiled from the NEC estimates of the National Accounts. Estimates of the net donations to the government were available from the Central Bank Balance of Payments. (Consult notes on Rest of the World Account).

Government current expenditures (already derived and described in the earlier paragraphs) plus transfer payments, estimates of which were taken from the NEC accounts plus Government savings a residual item, all added up to form total Government Outlay.

NA-V COMBINED CAPITAL ACCOUNT

The components of gross savings, namely, household corporate and government savings and depreciation have been computed for in the previous accounts and the methodology used in arriving at their values have also been described in the preceeding notes.

For the items making up outlay the gross domestic investment figures at current prices are the same as those used in computing the final GNP at current prices. The procedure for estimating net lendings abroad are described in the notes on the Rest of the World Account.

TABLE I - PHILIPPINE: GROSS DOMESTIC PRODUCT AT MARKET PRICES, CY 1956 - 1962

(In Million Pesos at Current Prices)

	1956	1957	1958	1959	1960	1961	1962	% Increase 1961-62
Agriculture	2,845	2,987	3,173	3,458	3,426	3,808	4,273	12.21
Mining	107	123	117	138	144	168	219	30.36
Manufacturing	1,130	1,327	1,533	1,603	1,741	2,169	2,406	10.93
Construction	495	558	491	512	562	578	528	(8.65)
Trade	999	1,092	1,144	1,289	1,232	1,458	1,883	29.15
Transportation	286	321	351	361	385	416	446	7.21
Government [a]	486	601	646	690	763	860	915	6.40
Services	1,662	1,725	1,952	2,121	2,251	2,351	2,475	5.27
Net Domestic Product at Factor Cost	8,010	8,734	9,407	10,172	10,504	11,808	13,145	11.32
Indirect Taxes [b]	677	753	749	807	951	1,049	1,106	
Depreciation	441	480	499	554	615	696	867	24.6
Gross Domestic Product at Market Prices	9,128	9,967	10,655	11,533	12,070	13,553	15,118	
% Annual Changes	--	9.19	6.90	8.24	4.66	12.29	11.55	
Comparisons: NEC (GNP)		6.26	6.84	6.46	6.66	10.73	10.49	

---

[a] Adjusted from NEC data to cover only national and local governments since salaries and wages paid by government corporations are included under value added in other sectors.

[b] For 1960-1962, inclusive of government share of margin fee collections.

Rev. 11-21-63
PIA/ADP

TABLE II - GROSS DOMESTIC EXPENDITURES, CY 1956-1962
(In Million Pesos at Current Prices)

	1956	1957	1958	1959	1960	1961	1962
Total Consumption Expd.	7,047	7,972	8,384	8,829	9,078	10,219	11,269
Food	3,781	3,998	4,402	4,247	4,346	4,915	5,384
All Others	3,266	3,974	3,982	4,582	4,732	5,304	5,885
Gov't Current Expd.	801	853	911	986	1,091	1,223	1,306
Gross Domestic Investment	1,277	1,444	1,433	1,610	1,921	2,292	2,507
Construction	728	821	723	753	827	848	776
Durables	407	514	542	651	1,005	1,250	1,447
Net Change in Inventories	142	109	168	206	89	194	284
Net Exports	3	(302)	(73)	108	(20)	(181)	36
Exports	1,238	1,193	1,269	1,344	1,431	1,705	3,149
Imports	1,235	1,495	1,342	1,236	1,451	1,886	3,113
GROSS DOMESTIC PRODUCT	9,128	9,967	10,655	11,533	12,070	13,553	15,118
Investment Coefficient	14.0%	14.5%	13.4%	14.0%	15.9%	16.9%	16.6%
Gross Domestic Savings	1,280	1,142	1,360	1,718	1,901	2,111	2,543
% Annual Change in Gross Product		9.19	6.90	8.24	4.66	12.29	11.55
COMPARISONS:							
NEC Official Accounts							
Dr. Hooley's Study on Savings	1,325	1,576	1,580	1,739	1,885	n.a.	n.a.
PIA Estimates	1,280	1,142	1,360	1,718	1,901	2,111	2,543
(PIA - Hooley)	(45)	(434)	(220)	(21)	16		

Rev. 11-21-63
PIA/ADP

TABLE III - GROSS NATIONAL (PRODUCT) EXPENDITURES, CY 1956-1962
(In Million Pesos at Current Prices)

Sector	1956	1957	1958	1959	1960	1961	1962
Agriculture	2,845	2,987	3,173	3,458	3,426	3,808	4,273
Mining	107	123	117	138	144	168	219
Manufacturing	1,130	1,327	1,533	1,603	1,741	2,169	2,406
Construction	495	558	491	512	562	578	528
Trade	999	1,092	1,144	1,289	1,232	1,458	1,883
Transportation	286	321	351	361	385	416	446
Government [a]	486	601	646	690	763	860	915
Services	1,662	1,725	1,952	2,121	2,251	2,351	2,475
Net Domestic Product at Factor Cost	8,010	8,734	9,407	10,172	10,504	11,808	13,145
Indirect Taxes [b]	677	753	749	807	951	1,049	1,106
Depreciation	441	480	499	554	615	696	867
Gross Domestic Product at Market Prices	9,128	9,967	10,655	11,533	12,070	13,553	15,118
Less: Net Remittances	78	95	95	130	154	111	79
Gross National Product	9,050	9,872	10,560	11,403	11,916	13,442	15,039

---

[a] Adjusted from NEC data to cover only national and local governments since salaries and wages paid by government corporations are included under value added in other sector.

[b] For 1960-1962 -- inclusive of Government share of Margin Fee Collections.

Table III - Gross National (Products) Expenditures, CY 1956-1962 (Cont.)

Sector	1956	1957	1958	1959	1960	1961	1962
Private Consumption Expenditures	7,047	7,972	8,384	8,829	9,078	10,219	11,269
Government Current Expenditures	801	853	911	986	1,091	1,223	1,306
Salaries	486	601	646	690	763	860	915
Others	315	252	265	296	328	363	391
Gross Domestic Investment	1,277	1,444	1,433	1,610	1,921	2,292	2,507
Construction	728	821	723	753	827	848	776
Durables	407	514	542	651	1,005	1,250	1,447
Changes in Inventory	142	109	168	206	89	194	284
Net Exports	3	(302)	(73)	108	(20)	181	36
Exports of Goods & Services	1,238	1,193	1,269	1,344	1,431	1,705	3,149
Imports of Goods & Services	1,235	1,495	1,342	1,236	1,451	1,886	3,113
Gross Domestic Expenditures at Market Prices	9,128	9,967	10,655	11,533	12,070	13,553	15,118
Less: Net Remittances	78	95	95	130	154	111	79
Gross National Expenditure	9,050	9,872	10,560	11,403	11,916	13,442	15,039
Percent Annual Change in GNP		9.08	7.00	7.98	4.50	12.81	11.88

Rev. 11-21-63
PIA/ADP

TABLE IV - PHILIPPINES: GROSS DOMESTIC EXPENDITURES AT 1962 MARKET PRICES, CY 1956-1962
(In Million Pesos)

	1956	1957	1958	1959	1960	1961	1962
Private Consumption Expenditures	8,758	9,670	9,897	10,315	10,480	10,997	11,269
Food	4,592	4,834	5,173	4,824	4,982	5,306	5,384
Clothing	571	595	516	544	585	568	718
Beverage and Tobacco	683	668	721	699	734	785	750
Shelter	757	750	852	875	991	1,038	1,072
Durables	160	170	185	227	272	332	336
Miscellaneous	1,995	2,653	2,450	3,146	2,916	2,968	3,009
Government Current Expenditures	902	931	976	1,047	1,132	1,243	1,306
Salaries and Wages	518	636	674	710	776	868	915
Others	384	295	302	337	356	375	391
Gross Domestic Investments	1,854	2,084	2,082	2,191	2,450	2,675	2,507
Construction	893	984	872	863	887	918	776
Durables	787	944	983	1,065	1,470	1,552	1,447
Net Change in Inventories	174	156	227	263	93	205	284
Net Exports	(152)	(755)	(312)	(65)	(259)	(287)	36
Exports of Goods & Services	2,533	2,398	2,452	2,430	2,532	2,559	3,149
Imports of Goods & Services	2,685	3,153	2,764	2,495	2,791	2,846	3,113
Gross Domestic Product	11,362	11,930	12,643	13,488	13,803	14,628	15,118
Percent Annual Change in Real Product	-	5.0	6.0	6.8	2.3	6.0	3.3

Table IV - Philippines: Gross Domestic Expenditures, CY 1956-1962 (Cont.)

	1956	1957	1958	1959	1960	1961	1962
Investment Coefficients:							
Total Investments	16.24	17.47	16.47	16.24	17.75	18.29	16.58
Fixed Investments	14.79	16.16	14.67	14.29	17.08	16.89	14.70
Inventory Changes	1.55	1.31	1.80	1.95	.67	1.40	1.88
Price Index for Inflation (1962 = 100) (Implicit Price Index of Gross Product)	80.34	83.54	84.28	85.50	87.44	92.65	100.00
Percent Annual Change in Price Levels	-	3.98	.88	1.45	2.27	5.96	7.93

Rev. 11-21-63
PIA/ADP

TABLE V - PHILIPPINES: GROSS DOMESTIC PRODUCT AT 1962 MARKET PRICES, CY 1956 - 1962

(In Million Pesos)

	1956	1957	1958	1959	1960	1961	1962
AGRICULTURE	3,550	3,578	3,694	3,936	3,835	4,090	4,273
Food Crops	1,167	1,166	1,219	1,313	1,346	1,423	1,439
Commercial Crops	706	747	730	736	745	806	874
Livestock and Poultry	934	906	969	937	768	862	878
Farm Marketing & Cons.	906	897	914	920	831	850	854
Increase in Stocks	28	9	55	17	(63)	12	24
Fishing	397	396	441	449	458	467	488
Forestry	444	462	436	608	623	644	710
Less: Depreciation	97	98	101	108	105	112	117
MINING (Excldg. Cement)	199	185	176	200	198	211	219
MANUFACTURING	1,486	1,601	1,750	2,004	2,111	2,268	2,406
Organized Manufacturing	1,308	1,412	1,550	1,803	1,906	2,050	2,175
Rice Milling	136	149	157	152	153	156	160
Corn Milling	17	17	18	21	22	23	24
All Others	25	23	25	28	30	39	47
CONSTRUCTION	607	668	592	587	603	624	528
TRADE	1,459	1,566	1,582	1,673	1,731	1,828	1,883
TRANSPORTATION	333	368	390	404	414	440	446
GOVERNMENT	518	636	674	710	776	868	915
SERVICES	1,728	1,764	2,130	2,228	2,335	2,406	2,475

Table V - Philippines: Gross Domestic Product, CY 1956 - 1962 (Cont.)

	1956	1957	1958	1959	1960	1961	1962
SUB-TOTAL: Net Domestic Product at Factor Cost	9,880	10,365	10,988	11,742	12,003	12,735	13,145
INDIRECT TAXES [a]	829	870	922	985	1,008	1,073	1,106
DEPRECIATION	653	694	733	761	792	820	867
GROSS DOMESTIC PRODUCT AT 1962 MARKET PRICES	11,362	11,930	12,143	13,488	13,803	14,628	15,118
Annual rate of growth		5.0	6.0	6.8	2.3	6.0	3.3
Comparison of growth rates:							
IBRD		4.9	6.7	3.9	3.3[p]	n.a.	n.a.
NEC (GNP)		5.1	3.2	5.9	3.4	5.9	4.6%

---

[a] Derived by applying ratio of indirect taxes to NDP in the base year (1962) for all years. Rate used was 8.44%

[p] Preliminary

Rev. 11-21-63
PIA/ADP

TABLE VI - GROSS NATIONAL (PRODUCT) EXPENDITURES AT 1962 PRICES[a]
CY 1956-1962
(Million Pesos)

	1956	1957	1958	1959	1960	1961	1962
Agriculture	3,550	3,578	3,694	3,936	3,835	4,090	4,273
Mining	199	185	176	200	198	211	219
Manufacturing	1,486	1,601	1,750	2,004	2,111	2,268	2,406
Construction	607	668	592	587	603	624	528
Trade	1,459	1,566	1,582	1,673	1,731	1,828	1,883
Transportation	333	368	390	404	414	440	446
Government	518	636	674	710	776	868	915
Services	1,728	1,764	2,130	2,228	2,335	2,406	2,406

[a] The values of exports and imports in domestic currency are converted at a unitary exchange rate based on the effective import rate prevailing in 1962 (₱3.82:$1). The import rate has been used on the reasoning that the import rate measures the value of foreign exchange to the economy.

The use of a unitary exchange rate, in effect, reduces the size (in domestic currency equivalent) of the current deficit and to that extent eliminates the monetary illusion created by multiple exchange rates on the amount of the current deficit.

The total amount of the differential in peso values of exports and imports created by multiple exchange rates is equivalent to a "tax" on export incomes - i.e. the realized incomes of the export sector are less by the amount of this differential. Accordingly, the full amount of this differential for any one year has been added to incomes originating from "Trade" as "imputed" income to the export trade sector.

Conversely, this adjustment removes the understatement of the magnitude of gross domestic savings inherent in the use of multiple exchange rates for converting the dollar value of the current deficit into its domestic currency equivalent. Viewed in another way, the transfer of incomes from the export sector to the Central Bank via multiple exchange rates is equivalent to a "forced saving" on the export sector. To the extent that the equivalent "incomes" are "sterilized" at the Central Bank - as in fact they are - there is forced savings for the economy as a whole. The effect of this forced saving is not formally different from the effect of taxation on domestic incomes accumulated as cash balances of the national government.

The amount of the "differential" for 1956 to 1962 respectively are as follows: (In Million Pesos); 27; 25; 25; 26; 26; 27; and 33.

Table VI - Gross National (Product) Expenditures, CY 1956-1962 (Cont.)

	1956	1957	1958	1959	1960	1961	1962
Net Domestic Product At Factor Cost	9,880	10,365	10,998	11,742	12,003	12,735	13,145
Indirect Taxes	829	870	922	985	1,008	1,073	1,106
Depreciation	653	694	733	761	792	820	867
Gross Domestic Product at Market Prices	11,362	11,930	12,643	13,488	13,803	14,628	15,118
Less: Net Remittances	169	201	196	262	297	168	79
Gross National Product	11,193	11,729	12,447	13,226	13,506	14,460	15,039
%Annual Change in GNP		4.79	6.12	6.26	2.12	7.06	4.00
Private Consumption Expenditures	8,758	9,670	9,897	10,315	10,480	10,997	11,269
Government Current Expenditures	902	931	976	1,047	1,132	1,243	1,306
Salaries	518	636	674	710	776	868	915
Others	384	295	302	337	356	375	391
Gross Domestic Investment	1,854	2,084	2,082	2,191	2,450	2,675	2,507
Construction	893	984	872	863	887	918	776
Durables	787	944	983	1,065	1,470	1,552	1,447
Changes in Inventory	174	156	227	263	93	205	284
Net Exports	(152)	(755)	(312)	(65)	(259)	(287)	36
Exports of Goods and Services	2,533	2,398	2,452	2,430	2,532	2,559	3,149
Imports of Goods and Services	2,685	3,153	2,764	2,495	2,791	2,846	3,113
Gross Domestic Exp. at Market Prices	11,362	11,930	12,643	13,488	13,803	14,628	15,118
Less: Net Remittances	169	201	196	262	297	168	79
Gross National Expenditures	11,193	11,729	12,447	13,226	13,506	14,460	15,030

Rev. 11-22-63
PIA/ADP

TABLE VII - COMPARISON OF NEC AND PIA ESTIMATES
GROSS DOMESTIC EXPENDITURES AT CONSTANT PRICES CY 1960-1962
(In Million Pesos)

	NEC ESTIMATES AT 1955 PRICES					PIA ESTIMATES AT 1962 PRICES				
	1960	1961	1962	Percent Increase 1960-61	Percent Increase 1961-62	1960	1961	1962	Percent Increase 1960-61	Percent Increase 1961-62
Consumption Expenditures	9,092	9,383	9,590	3.2	2.2	10,480	10,997	11,269	6.61	2.47
Government Current Expenditures	959	1,004	1,069	4.7	6.5	1,132	1,243	1,306	9.81	5.07
Salaries	648	674	706	4.0	4.7	776	868	915	11.86	5.41
Others	311	330	363	6.1	10.0	356	375	391	5.34	4.26
Gross Domestic Investment	1,031	1,227	1,147	19.0	(6.5)	2,450	2,675	2,507	9.18	(6.28)
Construction	416	522	442	25.5	(15.3)	887	918	776	3.49	(15.47)
Durables	633	653	655	3.2	0.3	1,470	1,552	1,447	5.58	(6.77)
Net Change in Inventories	(18)	52	50	388.9	(3.8)	93	205	284	120.43	38.54
Net Exports	(69)	(51)	217	26.1	525.5	(259)	(287)	36	10.81	125.43
Exports	1,894	1,952	2,407	3.1	23.3	2,532	2,559	3,149	1.07	23.06
Imports	1,963	2,003	2,190	2.0	9.3	2,791	2,846	3,113	1.97	9.38
Gross Domestic Product	11,013	11,563	12,023	5.0	4.0	13,803	14,628	15,118	5.98	3.35

PIA/ADP
Rev. 11-22-63

TABLE VIII - COMPARISON OF PIA & NEC ESTIMATES OF THE NET DOMESTIC PRODUCT BY INDUSTRIAL ORIGIN CY 1960-62
(In Million Pesos)

	NEC ESTIMATES AT 1955 PRICES					PIA ESTIMATES AT 1962 PRICES				
				Percent Increase					Percent Increase	
	1960	1961	1962	1960-61	1961-62	1960	1961	1962	1960-61	1961-62
Agriculture	3,093	3,280	3,474	6.0	5.9	3,835	4,090	4,273	6.6	4.5
Mining a/	153	162	165	5.9	1.9	198	211	219	6.57	3.8
Manufacturing	1,506	1,607	1,724	6.	7.3	2,111	2,268	2,406	7.4	6.1
Construction	283	355	299	25.4	(15.8)	603	624	528	3.5	(15.4)
Trade	1,091	1,194	1,249	9.4	4.6	1,731	1,828	1,883	5.6	3.0
Transport and Communication	345	367	372	6.4	1.4	414	440	446	6.3	1.4
Government	862	896	940	3.9	4.9	776	868	915	11.9	5.4
Services	2,186	2,254	2,318	3.1	2.8	2,335	2,406	2,475	3.0	2.9
Net Domestic Product at Factor Cost	9,519	10,115	10,541	6.3	4.2	12,003	12,735	13,145	6.1	3.2
Indirect Taxes						1,008	1,073	1,106	6.4	3.1
Depreciation						792	820	867	3.5	5.7
Gross Domestic Product						13,803	14,628	15,118	6.0	3.4

PIA/ADP
Rev. 11-22-63

TABLE NA-I - NATIONAL INCOME & PRODUCTS ACCOUNT CY 1956-1962
(At Current Prices in Million Pesos)

Item	1956	1957	1958	1959	1960	1961	1962
Compensation of Employees	3,311	3,618	3,907	4,154	4,317	4,929	5,485
a) Agricultural a/	797	836	888	968	959	1,066	1,196
b) Other b/	2,514	2,782	3,019	3,186	3,358	3,863	4,289
Entrepreneurial and Property Income of Persons	4,215	4,605	4,972	5,286	5,494	6,274	6,981
a) Agricultural c/	2,048	2,151	2,285	2,490	2,467	2,742	3,077
b) Other d/	2,167	2,454	2,687	2,796	3,027	3,532	3,904
Private Corporate Income e/	356	352	367	523	473	421	475
Property Income of Government	50	64	66	79	66	73	125
NATIONAL INCOME at Factor Cost	7,932	8,639	9,312	10,042	10,350	11,697	13,066
Depreciation	441	480	499	554	615	696	867
Indirect Taxes	677	753	749	807	951	1,049	1,106
GROSS NATIONAL PRODUCT at Market Prices	9,050	9,872	10,560	11,403	11,916	13,442	15,039

---

a/ Derived by taking 28% of income originating from Agriculture.

b/ Residual derived by subtracting Agricultural from total compensation of employees.

c/ Derived by taking 72% of income originating from Agriculture.

d/ Residual derived by subtracting Agricultural from Entrepreneurial and Property Income.

e/ Consult Table on National Income Distribution by Type.

Table NA-I National Income & Products Account CY 1956-1962 (Continued)

Item	1956	1957	1958	1959	1960	1961	1962
Private Consumption Expenditures	7,047	7,972	8,384	8,829	9,078	10,219	11,269
Government Current Expenditures Salaries	801	853	911	986	1,091	1,223	1,306
Salaries	486	601	646	690	763	860	915
Others	315	252	265	296	328	363	391
Gross Domestic Inv.	1,277	1,444	1,433	1,610	1,921	2,292	2,507
Construction	728	821	723	753	827	848	776
Durables	407	514	542	651	1,005	1,250	1,447
Net Change in Inv.	142	109	168	206	89	194	284
Net Export and Investment Income	(75)	(397)	(168)	(22)	(174)	(292)	(43)
Exports	1,238	1,193	1,269	1,344	1,431	1,705	3,149
Imports	1,235	1,495	1,342	1,236	1,451	1,886	3,113
Net Factor Income	(78)	(95)	(95)	(130)	(154)	(111)	(79)
GROSS NATIONAL PRODUCT At Market Prices	9,050	9,872	10,560	11,403	11,916	13,442	15,039

Rev. 11-22-63
PIA/ADP

TABLE NA-I-A - NATIONAL INCOME DISTRIBUTION BY TYPE, CY 1956-1962
(At Current Prices in Million Pesos)

Type of Income	1956	1957	1958	1959	1960	1961	1962
Compensation of Employees b/	3,311	3,618	3,907	4,154	4,317	4,929	5,485
Entrepreneurial Property Inc. c/	4,215	4,605	4,972	5,286	5,494	6,274	6,981
Private Corporate Income a/	356	352	367	523	473	421	475
Property Income of Government a/	50	64	66	79	66	73	125
National Income at Factor Cost	7,932	8,639	9,312	10,042	10,350	11,697	13,066

a/ Figures derived from the NEC National Accounts, Statistical Reporter;
1956 and 1957 figures from the 1960 Statistical Reporter
1958 figures from the 1961 Statistical Reporter
1959 figures from the 1962 Statistical Reporter
1960 to 1962 figures from the mimeographed National Accounts of the Philippines, 1960-1962.

b/ Derived by first getting the income from unincorporated profits which was the residual taken by subtracting Private Income and Entrepreneurial Income from the NNP at factor cost. 56% of the Income from Unincorporated profits went to Entrepreneurial and Property Income of persons while 44% was attributed to the compensation of employees. This procedure was adapted from the NEC estimation of National Accounts.

Rev. 11-22-63
PIA/ADP

Reproduced from The Philippine Economic Journal, Volume III, No. 2, Second Semester, 1964

A CRITIQUE OF CAPITAL FORMATION ESTIMATES IN ASIA, WITH SPECIAL REFERENCE TO THE PHILIPPINES*

RICHARD W. HOOLEY
Institute of Economic Development and Research
University of the Philippines

Since World War II most countries have recognized the desirability of constructing national income and product accounts as a comprehensive framework for quantitative analysis. Estimates of capital formation are considered an integral part of these accounts. The low reliability of statistical data in many countries may not in itself constitute an insuperable obstacle to the construction of national accounts. On the contrary, provided the sectoring and methods of estimation are appropriate to the economic system they purport to describe, the results enable economists to make maximum use of available information.

It will be argued in this paper, however, that estimates of capital formation for countries in this region are of extremely limited usefulness, either for planning or as an adjustment in theoretical investigations, largely because neither the sectoring nor the estimation methods employed recognize certain important characteristics of the economic structure or of the statistical data found in these countries.

I. APPROACHES TO THE ESTIMATION OF CAPITAL FORMATION IN ASIA

Estimates of capital formation for the Philippines are available since 1946. The original estimates for the years 1946-1951 were prepared by William C. Abraham.[1] The series

---

*Research upon which this article is based was supported by the Rockefeller Foundation.

[1] The National Income of the Philippines and Its Distribution. New York: United Nations, 1962.

was continued by the Central Bank and later by the National Economic Council which now prepares the current estimates.[2] Although a number of changes have been made in the estimating procedure over the years, the fundamental method used is still the commodity flow approach. In this respect the Philippine accounts are similar to those of other countries of this area.

Out of 12 Asian countries for which estimates of capital formation are available, 10 use the commodity-flow approach, while Japan and Taiwan extensively use the more direct method of estimating capital formation from the expenditure side. Most of these countries, like the Philippines, rely primarily on foreign trade statistics which are generally plentiful, as the overwhelming proportion of capital equipment used in these countries is imported. With the proper adjustments for mark-ups, and the application of ratios to allocate the flow of resources into sectors and industries, these import data are transformed into an (apparently) finely detailed set of capital formation estimates.

As originally developed by Kuznets, the commodity flow approach measures capital formation by the volume of resources flowing into it. Apparently Kuznets chose this approach because it gave the most complete coverage then possible, and because he had available a fairly extensive body of reliable data (from both government and industry sources) on output of commodities and services being used for capital formation in the United States.

He also prepared estimates of some components on an expenditure basis, but the inference that can be drawn from his discussion is that these are subject to a much wider margin of error. In any event, Kuznets' major interest at that time focused on the level and rate of aggregate investment (including a few of its major components), and changes in those variables occurring within two decades.[3]

In the years following the publication of Kuznets' work, the commodity flow method of estimating capital formation became increasingly important. With the adoption of modern income and product accounts by under-developed countries after World War II, estimates of capital formation based on the commodity flow method became more common. In preparing estimates of capital formation in under-developed countries, each estimator has adopted the method suitable to his country. In actual practice, however, the tendency has been to rely primarily, if not exclusively, on the commodity flow approach largely because it has served so well in preparing the estimates of industrialized countries such as the United States.

---

[2] The Statistical Reporter, April, 1962.

[3] S. Kuznets, National Income and its Composition, 1919-1928. New York: National Bureau of Economic Research, 1941; see also his article on "National Income" in the Encyclopedia of the Social Sciences, pp. 268-283. It is clear from the latter that Kuznets recognized certain desirable properties in the expenditure approach, which prompted him to say that if his data were better, it could be used to study "the various ways in which income is either spent or saved (which is) ... essential ... in dealing with a number of economic problems." ibid., pp. 214-215.

II. SPECIAL PROBLEMS IN USING THE COMMODITY FLOW METHOD IN UNDER-DEVELOPED COUNTRIES OF ASIA

A number of important problems arise when the commodity flow method is applied in under-developed countries. Some have been discussed in the literature; others have received little attention. A summary of the more important problems follows with attention being focused on those issues which have received the least attention.

Underestimation of Inventory Accumulation

One of the truly important components of capital formation in an under-developed country is inventory. Inventory change usually is measured on the basis of data covering a few commodities. In the Philippines, for example, changes in livestock are obtained from the Department of Agriculture and Natural Resources. Movements in sugar inventories are obtained from the sugar quota administration, while for industry and trade they are estimated as fixed percentages of output. To a considerable extent, changes in total inventories depend on changes in inventories of a few primary commodities.

The procedure of basing inventory changes on a few primary commodities, as done in most countries of Asia (where inventory changes are measured at all), assumes that these commodities do in fact account for a large proportion of inventories held. While this assumption might have been reasonable 25 to 50 years ago, it is no longer consistent with the facts. With the growth of domestic industry, domestic business inventory has become an important component of capital formation in these countries. Indeed, samples of manufacturing establishments in the Philippines reveal that on the whole the structure of capital formation in recent years gives nearly as much weight to inventories as to fixed assets (at book value).[4]

---

[4] In the period 1959-1961, for example, inventory accumulation of P780 million was only slightly smaller than fixed capital additions of P905 million. Data from IEDR Flow-of-Funds worksheets.

The reason for the heavy emphasis on inventories in industry can be traced in large part to the extensive use of imported (fabricated) inputs which is typical of input patterns in manufacturing in early stages of development. At any rate, failure to cover adequately inventories of the modern business sector in existing data results in extremely large errors of measurement, as can be seen from Table 1 which contrasts inventory estimates as published for Philippine manufacturing and mining with those based on an expenditure approach.

TABLE 1

COMPARISON OF TWO ESTIMATES OF INVENTORY CHANGES FOR PHILIPPINE MANUFACTURING AND MINING INDUSTRIES

(Million Pesos)

	PUBLISHED				EXPENDITURE				
	'59	'60	'61	Total	'59	'60	'61	Total	Percentage of Under-estimate
Manufacturing	24	22	42	88	115	235	401	751	853.4
Mining	3	1	4	8	3	6	20	29	362.5
Total	27	23	46	96	118	241	421	780	812.5

SOURCE: *The Statistical Reporter* (April, 1962), and IEDR Flow Flow-of-Funds worksheets for about 250 mining and manufacture corporations.

The data in Table 1 make clear a substantial underestimate -- of roughly ₱700 million or 800 percent -- in existing official estimates of inventory accumulation. Moreover, further examination shows that out of the four changes shown above, existing estimates are in the wrong direction twice, or one-half the time.

Another important conceptual difficulty of the commodity flow method relates to the problem of double counting when sample data are used to supplement information obtained on a commodity-flow basis. When, for example, vehicles are imported and counted as fixed investment, the same vehicles may be reported in inventory. This results in double counting and distorts the structure of capital formation in the final estimates.

One result of this understatement of inventory accumulation which exists in most Asian national income accounts is a persistent underestimate of capital requirements in economic planning. For example, the second Five-Year Plan of India does not provide for inventory accumulation.[5] Again, The World Bank projections for aggregate investment in the Philippines, 1962-1966, show P13.04 billion for fixed capital, but only P0.77 billion for inventories.[6] The latter suggest a balance sheet ratio of fixed capital-inventories of 17:1. Such a high ratio would be approximated by hydroelectric power, but, so far as available data indicate, by no other industrial, commercial or agricultural group.

Underestimation of Own-account Construction

When construction is estimated by the commodity-flow method, data must be assembled on the output of construction materials (cement, lumber, etc.). An addition is then usually made for labor and other installation costs. Two difficulties arise. Statistical series on the output of construction materials are generally not highly developed in this country. This is partly because small firms predominate in the output of most construction materials with the exception of cement. Second, a large volume of construction is own-account construction, using entirely indigenous materials, or a mixture of commercially produced and indigenous materials (such as mine tunnels, farm irrigation works, and additions to structures of medium and small factory enterprises). Again, the labor mark-up ratio is troublesome in proportion to the heterogeneity of types of buildings, which is probably proportionately greater in under-developed countries. Furthermore, the objection concerning double counting again can be introduced where surveys of construction are used to supplement data on building derived from the import statistics: An item may get measured once as an import and a second time as part of a completed structure.

It is obvious, therefore, that the resulting estimates for construction must be approximate. Apparently, capital formation using imported building materials gets counted; that using domestic commercial contractors is probably somewhat underestimated, and that own-account construction using indigenous materials is not covered; and the whole amount is marked up by a ratio which is (hopefully) correct, but in any event insensitive to changes in the composition of construction.

---

[5] George Rosen, Industrial Change in India. Glencoe: Free Press, 1958, p. 56.

[6] IBRD Mission in the Philippines, A Program for Economic Growth in the Philippines (Mimeo., 1962), p. 44.

Mark-up and Allocation Ratios for Producer Tenables

Serious difficulties of estimation extend even to the category of capital formation taking the form of producer's durable goods--an area which might be expected to be relatively free from bias. As such, a large part of machinery and equipment is imported. In the Philippines, as in virtually all other countries of the area, producer goods are estimated on a commodity-flow basis. This involves identifying such things as agricultural machinery, electric motors, transport equipment, metal parts, etc. from detailed lists kept by public authorities. On the basis of value as reported at Customs, an appropriate mark-up ratio to cover costs involved in distribution and installation is applied to produce the final results. Some countries, like the Philippines, try to show a breakdown of this aggregate figure to reflect fixed investment in various industries, on the basis of identifying certain kinds of equipment used in specific industries.[7]

In the first place, mark-up ratios and ratios allocating goods among consumption and capital formation generally are extremely crude. Many Asian countries can not even undertake surveys to determine the rough magnitude of these mark-ups and leave the matter to the statistician's judgment. Even in those countries, such as the Philippines, where some work has been done, there is wide disagreement about what the ratio should be. The same can be said with respect to allocation ratios: even the employment of consultants and technicians will leave a wide band of doubt as to how goods are to be allocated among their various uses, of which capital formation is only one. Only a few specialized items can be traced easily to capital formation. Many, if not most, such as electric motors, transport equipment, wire, etc., may be used in a number of alternative ways. Attempts to allocate these items to specific industry groups are likely to further tax the statistician's imagination and lead to even more arbitrary statistical manipulations.

Accuracy of Foreign Trade Statistics

To this point we have not questioned the accuracy of the data underlying most commodity flow estimates of capital formation in developing countries: foreign trade statistics. There is a widespread belief that "foreign trade statistics are relatively well developed in the countries of Asia." It is now time to examine this assumption.

---

[7] B. Ramamurti and Hans Th. Pedersen, Statistical Methods of Estimating Capital Formation Expenditure in ECAFE Countries (Mimeo.) pp. 6-12; a paper presented to the Asian Conference of the International Association for Research in Income and Wealth, held at the University of Hongkong, August 21-28, 1960.

First, there is a substantial margin of error even in the foreign trade statistics of industrialized countries, with correspondingly highly developed statistical systems, operating under conditions of relatively low tariffs or free trade. For example, Morgenstern has shown[8] that in the period 1909-1913, the balance of trade of the United States with Canada as reported by the United States was consistently less than the balance of trade between these two countries as reported by Canada; that the percentage difference between the two ranged from -30.2% in 1910 to +5.3% in 1913, and averaged -19.7% for the entire five-year period. Similar results were obtained for calculations involving the United States and other European countries. With respect to individual commodities -- even for gold movements where data might be expected to be quite accurate, -- errors of equal or greater magnitude were encountered.

What is likely to be the situation in under-developed countries? Since World War II most of the countries in Asia have controlled foreign trade. The nature of these controls indicates that demand for imports exceeded available supply at existing exchange rates. The existence of a flourishing illegal market for foreign exchange in most cases is *prima facie* evidence of illegal importations. In all likelihood *at least* some of these importations were capital goods.

One of the standard replies to this type of criticism is that even though series such as these may be in error, the errors are uniform over time; therefore, the resulting series reliably indicate the *trend* if not the absolute *level* of foreign trade. On the contrary, however, it is most probable that the degree of under-reporting of imports is closely correlated with the discrepancy between the official rate of exchange and the rate prevailing in the free market. For most Asian countries using exchange and import controls, this discrepancy can be shown to follow a distinct path of its own over time; hence the inconsistency of maintaining that the errors do not affect the trend of the estimates. As an example of this, the data (Table 2) showing undervaluation of textile imports into the Philippines are compared with the discrepancies between the official value of the peso and the market value as reported in Hongkong.

The conclusion seems to be that foreign trade statistics of economies with foreign exchange controls are likely to contain large errors, and that these errors are probably not stable over time, either for total trade or for individual components. The evidence suggests that official data will tend to understate the value of imports substantially. In any event, they are not a dependable source of data for constructing estimates of capital formation, either for short or for long periods.

---

[8] O. Morgenstern, On the Accuracy of Economic Observation. Princeton: Princeton University Press, 1963, Chapter 9, esp. Table II.

Conceptual Limitations for Development Planning

Let us now direct attention to the question whether commodity flow estimates of capital formation as currently prepared are conceptually suited to the task of analyzing the economic development process. It should already be clear that it is the nature of commodity flow estimates (as applied in under-developed countries) to arrive first at an aggregate which, after a few important adjustments, represents aggregate domestic investment. Some crude detail on the distribution of investment by sector or by industry can sometimes be achieved but each successive step involves additional (sometimes wholly arbitrary) assumptions with correspondingly reduced accuracy. Certain distinctions, such as the distribution among, say, corporate and non-corporate establishments, or between agricultural and non-agricultural establishments, are virtually impossible to derive without intolerably large margins of error.

TABLE 2

RELATIONSHIP BETWEEN "UNDERVALUATION" OF TEXTILE IMPORTS AND "OVERVALUATION" OF PESO, 1955-1959

	Undervaluation of textile imports[1] (%)	Overvaluation of peso[2] (%)
1955	1.35	1.43
1956	1.51	1.61
1957	1.55	1.75
1958	1.54	1.61
1959	2.16	2.15

SOURCE: Pick's Currency Yearbook, 1961. New York: Pick Publishing Corporation, 1961, p. 334; R. Hooley, Saving in the Philippines, 1951-1960. Quezon City: IEDR, 1963, pp. 36-37.

[1] $\frac{X_{JS} - I_P}{I_P}$ [2] $\frac{P_M - P_f}{P_f}$

X_{JS} = exports of textiles from U.S. and Japan, according to U.S. and Japanese sources.

I_P = imports of textiles from U.S. and Japan, according to Philippine sources.

P_M = free market value of the peso as of June 30.

P_f = official value of peso as of June 30.

It is precisely the structure of investment rather than its aggregate level or rate on which more recent theories of economic growth and development would have us focus attention. True, in his General Theory, Keynes referred only to aggregate investment, its level and fluctuations. He made this assumption, however, not because aggregate investment is of universal importance but because he found, in previous investigation of short-run fluctuations of investment in Great Britain, that investment structure remained stable over the business cycle.[10] Unfortunately, the discussion of saving and investment which followed publication of the General Theory tended to lose sight of the importance of changes in the structure of capital associated with long-run growth. Models of the Harrod-Domar type, for example, concentrate entirely on explaining long-run growth in terms of aggregate saving and investment.

When estimating capital formation for an under-developed country, we are not interested in analyzing short-run fluctuations in a business cycle framework. Attention must be focused on problems of secular growth, which at the least implies major structural changes in investment and other closely associated variables. Hence the need for a method of estimating capital formation which makes maximum use of available data on the distribution of investment. Even if existing estimates of aggregate capital formation were more accurate than they usually are, they would still be deficient because of the limitations which they place on determining changes in the structure of investment over time.

III. POSSIBILITIES OF MAKING EXTENSIVE USE OF DIRECT ESTIMATES OF CAPITAL FORMATION IN ASIAN COUNTRIES

Direct Estimation of Capital Expenditure for the Corporate Sector

A much wider use of the expenditure approach would yield results which would be conceptually superior and more accurate. One reason for this superiority is that the expenditure approach makes maximum use of available data. Beginning with the corporate sector, one of the peculiarities of these countries is the high degree of industrial concentration. For example, the largest 30 manufacturing corporations in the Philippines control about 30 percent of total assets employed in manufacturing. In other industries, such as utilities, mining, finance, transportation, and communication (and including government corporations), the degree of concentration is even higher. It is possible to achieve surprisingly accurate estimates by sampling the population of large corporations exhaustively and adding a random sample of small corporations.[11] To some extent this method also applies to non-farm, non-incorporated business enterprises, where data are available either from regulatory commissions or from tax records. Although the error is distinctly greater with this sub-sector, the relatively high degree of concentration is again of great help.

---

[10] J. M. Keynes, A Treaties on Money, London: Macmillan, 1939, Vol. II, Bk. 6.

By constructing combined balance sheets by sector in this way, estimates of capital formation can be obtained as the first difference of the stock of fixed assets (structures and equipment) and inventories. Obviously, the data immediately yield capital formation by type, by sector, and by industry group, both net and gross of depreciation. The statistician need not apply allocation or mark-up ratios. In some cases the accounts of enterprises will have to be adjusted, because as reported they will be inconsistent with procedures adopted by other sectors. This occurs, for example, in the case of depreciation accruals. However, adjustments of this sort are relatively straight-forward and do not involve the wholesale raising-up of aggregates which often leads to such large errors in the final estimates.

Two brief examples may illustrate some of the interesting detail which expenditure estimates can give. The accounts of most countries in this area are similar to the Philippines in that they give no detail on flows by form of organization. This treatment has been justified on the grounds of the predominant form of business unit, employing only a few workers, often on a seasonal or migratory basis, and where systematic records are totally absent.[12]

Although widespread, this view is entirely inconsistent with data available in the Philippines. About 2 percent of non-agricultural firms are corporations, but they account for

---

[11] This procedure uses intensively the available data on larger corporations. If any estimation is done, it is done for small units which account for a much smaller share of the capital stock. Thus, the problem here is much more manageable than that involved in certain estimates of income, where one starts with small units and must estimate for the large units.

[12] *The National Income of the Philippines and its Distribution*, pp. 25-26.

60 percent of total assets employed outside of agriculture.[13] Thus, although small numerically, the corporate enterprises account for a predominant share of capital formation outside agriculture. Moreover, all of these firms are required to keep books on a double-entry basis, and to report annually to regulatory agencies. A similar situation appears to obtain in at least some other countries of the area such as Ceylon, India, and Thailand.

Finally, even if the corporate business sector were not as important as it is, there would have to be strong reasons for overlooking it as a sector. It seems clear that for any economic system undergoing a fundamental transition, changes in the form of business organization are likely to play a key role.[14] If we are to explore the relationship between business organization and growth, capital formation estimates from the expenditure side, which naturally organize themselves around a corporate, non-corporate frame of reference, are essential. This also makes possible a distinction between large and small units which is also useful in analysis.

The observation that under-developed economies are 'dualistic' in the sense of encompassing a highly industrialized, capital intensive enclave, usually located around the main urban center, and a non-commercial, labor intensive sector centered around agriculture and the rural areas, is a common conception in development literature. In Asian countries, expenditure data may, at least in rough outline, yield regional estimates of capital formation. While they may be approximate in nature, they will no doubt go a long way to fill in details of a scientific sort with respect to this notion of regional dualism.

Direct Estimation of Changes in Inventories of Capital Equipment, Structures and Own-Account Construction in the Non-Corporate Sector

The expenditure approach is applicable to both corporate and government sectors because of the high degree of concentration, and because these sectors are highly monetized. In non-corporate agriculture, however, neither the expenditure nor the commodity-flow approach are applicable. The sector is characterized by a low degree of monetization and often a relatively low degree of concentration as well.[15] Under these circumstances the only alternative open is to utilize periodic survey data, which operates essentially on an inventory basis. Such surveys should be made useful in estimating the stock of tangibles on farms.[16] Because these surveys are not likely to be made often, there will be an element of insensitivity in annual estimates derived from them. This may not be too important, if non-corporate agriculture accumulates slowly and without much change over short periods. If the latter view proves incorrect, the only alternative would seem to be that of intensifying efforts on agricultural surveys. Some use of commodity flow data may be made to estimate year-to-year changes, provided these data are used selectively and with car.

---

[13] Republic of the Philippines, Department of Commerce and Industry, Bureau of the Census and Statistics, Census of the Philippines: 1948, Vol. IV. Non-agriculture as used here includes mining, manufacturing, commerce, transportation, electric light and power.

[14] S. Kuznets, National Income, loc. cit.

91

IV. SUMMARY AND CONCLUSION

Several conclusions emerge from this brief survey of capital formation estimates in the Philippines and other Asian countries. First, in most cases the estimates are biased downwards, at least during the post-war period. Inadequate coverage of inventories and construction contribute in an important way to this bias, along with probable under-reporting of those items otherwise adequately covered by the commodity flow methods. Hence a good part of the observed difference between capital formation proportions in developed and under-developed countries probably can be attributed to statistical error.

Another inference we can make concerns certain apparent characteristics in the structure of capital formation in under-developed countries. According to most official estimates, for example, inventories form only a small fraction of aggregate capital formation, in some cases a smaller fraction than in highly developed countries. On the contrary, data on the Philippines and for those other countries for which expenditure estimates have been prepared (e.g., Japan and Taiwan) show a higher proportion of capital formation represented by inventories than in highly industrialized countries. And this is not attributable to the large proportion of activity accounted for by agriculture, because the heavy concentration of investment in inventories in underdeveloped countries seems to be associated with a peculiarity of the structure of industry in early stages of development.

---

[15] In the case of plantation-type unincorporated agricultural enterprises, this would constitute an exception. But often a large part of the plantation-type agricultural enterprises are already included in agricultural corporations.

[16] They will probably be of no use in counting intangibles (such as financial assets), but this is no problem since small farm units accumulate little in the way of intangibles

92

Finally, we should note that the proportion of capital formation taking place in the public sector tends to be overstated in the Philippines, and probably there exists similar overstatement in other Asian Countries. This arises from the fact that estimates for the public sector are often derived (at least in part) on an expenditure basis. On the other hand, the aggregate estimate for both public and private sectors is derived on a commodity-flow basis. Keeping in mind the downward bias that is likely to exist in the latter figure, the residual (which is private capital formation) will also be biased downward and possibly to a serious extent. It is in the nature of such residuals to be highly unreliable and to magnify the bias existing in the data from which they are derived. In any event, until existing estimating methods are improved, inferences with respect to the structure of capital formation in under-developed countries as contrasted to developed countries are open to the most serious objections.

These difficulties are not an insurmountable obstacle to scientific progress. If we will adopt statistical methods which will make maximum use of the peculiarities of the institutional configuration of under-developed countries, and which are suited to the questions that theory is really asking, substantial progress might be made in a relatively short time. I propose that an expansion of the expenditure method to cover all of the government and corporate, and part of the non-corporate business sectors, and utilizing slightly altered sampling techniques, will go a long way in the desired direction. Additional survey data, on changes in inventories of capital equipment and structure in construction, agriculture and households, supplemented by commodity flow data on a selective basis, would complete the general method which is being suggested.

-o0o-

REVIEW OF
ECONOMIC STATISTICS IN THE PHILIPPINES

Interim Report

Introduction

The terms of reference of the Statistical Advisor to the World Bank Resident Advisory Mission in the Philippines, as agreed upon with the Government of the Republic of the Philippines, are as follows:

> " .... to assist in an examination of the adequacy of existing economic statistics in various agencies of Government in order to advise on and assist in the preparation and introduction of statistics necessary to serve as measures of economic performance and as guides for policy and planning."

In the initial stages of the inquiry, two alternative lines of approach suggested themselves:

(a) To begin with a study of the overall state of the national accounts and subsequently to work backwards to an examination of the various statistical series underlying or required for national accounts and planning purposes, or

(b) to begin with an examination of the scope and reliability of the existing major statistical series relevant to national accounting and economic planning -- and only subsequently to ascertain the manner and extent to which these series are being incorporated in the national accounts framework and to attempt to assess the reliability of the estimates obtained.

Whatever the approach adopted, it would also be necessary in the latter stages of the investigation to endeavour to frame proposals for remedying the weaknesses and deficiencies, if any, that had come to light.

After brief consultation and in the light of previous experience, the second approach was decided upon and contact was established with the main statistics-producing agencies of the Government, including the Bureau of the Census and Statistics, the Department of Economic Research of the Central Bank, the Bureau of Agricultural Economics, etc. Subsequent experience would appear to confirm this decision. For in the absence of prior knowledge of the scope and nature of the major statistical series, it would not have been possible to discuss national income and other aggregative statistics except at the level of generalisations and principles.

Work on the examination of the main statistical series compiled by these agencies was commenced as of the beginning of January 1964 and continued until the beginning of March, when it was temporarily broken off in order to begin a study of the revised national accounts estimates for 1961 and 1962 and the preliminary estimates for 1963 which were released at about this time by the Office of Statistical Coordination and Standards, National Economic Council.

The results of the studies made up to the present time are incorporated in a series of working notes. As far as has proved practicable at this stage, summaries of the principal points contained in these notes are presented in parts II and III of this Report. It should be stated, however, that time has not always proved sufficient to date to permit the gathering of views and information from all the agencies concerned or interested in a particular series. This is a deficiency which it is hoped to correct at a later stage; for the possibility of a divergence of views between such agencies cannot, of course, be entirely ruled out. For example: the Bureau of Customs' views on the degree and extent of understatement of import values in customs manifests, or the average time lag between the date of customs clearance and the actual date of entry of imported goods into the country, may perhaps differ from those expressed by the statistical agencies compiling the foreign trade statistics.

For a number of fields in which studies are still in progress, including price statistics and price indexes, inter-island shipping, rail and road transportation and public utilities, no summaries have been brought in the present Report. Similarly, work in other fields such as financial statistics, population and demography, and the Population, Agricultural and Economic Censuses of 1960-1961 is scheduled to begin only at a later date.

During the course of inquiry, examination was made of a number of statistical series whose compilation and publication have lately been suspended, such as those on "Production of Selected Manufacturing Establishments" and "Employment and Earnings in Manufacturing Establishments" which were formerly compiled by the Bureau of the Census and Statistics. The findings in these fields are not included in the present report. Similarly, except in a few cases, no mention or discussion is made of the plans and proposals of the various statistical agencies for improving the scope and quality of the series compiled by them. This will be done at a later stage within the general framework of proposed new series and methods.

General Remarks

As will become evident from a reading of the technical chapters of this Report, the work performed to date has consisted mainly of carrying out part one only of the general terms of reference laid down i.e. "to assist in an examination of the adequacy of existing economic statistics in various agencies of Government .....". The emphasis in these chapters has therefore fallen inevitably on a detailed enumeration of the deficiencies and limitations observed. Except in a number of isolated instances, no indications are given as to how these deficiencies and limitations may perhaps be remedied. It is, of course, notoriously easier to point out what is faulty or lacking in a statistical series than to formulate concrete proposals for its improvement -- which must necessarily be preceded by thorough investigation of available and potentially available statistical sources. These sources may differ considerably from country to country, according to the differences in institutional and organizational patterns. Much of the remaining time allotted will consequently have to be devoted to such an investigation, as a preliminary to the formulation of possible alternative estimating procedures, especially for national accounting purposes.

It is felt, however, that enumeration of the limitations and deficiencies of the existing statistical series, even in the absence of concrete proposals for their remedy, can still serve the important if negative purpose of clarifying to analyst and policy makers the extent to which they may safely draw conclusions or base decisions on the statistical data at present available.

The emphasis inevitably placed in the present interim report on limitations and deficiencies should not be allowed to detract from the great amount of solid work that has been done in the field of economic statistics over the past decade. By building on the foundations already laid and by mobilizing the comparative wealth of statistical knowledge and experience already existing in the Philippines, it should be possible to reach the desired level of detail and reliability within the short space of a very few years.

Future Work Program

As has been indicated, a number of fields exist in which studies are still in progress but which it should be possible to complete with a moderate additional investment of time. This include:

price statistics and price indexes
inter-island shipping statistics
rail and road transportation statistics
public utilities statistics

Other fields in which work has not as yet been commenced and in which it will be necessary to invest rather more time include:

financial statistics
population and demographic statistics
the 1960 censuses of population and agriculture
the 1961 economic census
the partial private consumption estimates compiled by PIA

Completion of these projects will involve primarily a continuation of the close contacts already made with the Bureau of the Census and Statistics, the Department of Economic Research of the Central Bank and the Bureau of Agricultural Economics. In addition, however, it will be necessary to establish or extend the scope of contact with other government agencies, in order to ascertain the actual or potential usefulness for statistical and estimating purposes of the administrative statistics or other data and information collected and compiled by them. These agencies will probably include, among others:

The Department of Finance
The Department of Labour
The Bureau of Internal Revenue
The General Auditing Office
The Bureau of Customs
The Tariff Commission
The Department of Public Works
The Bureau of Commerce
The Social Security System (SSS)
The Government Service Insurance System (GSIS)
The Public Services Commission

Other fields to which some time should also be devoted are the updating of current statistical series, publication methods and policy and, possibly, certain aspects of statistical organization.

And lastly, it is felt to be essential that sufficient time be allocated in the final stages for summary discussions with the principal agencies engaged in statistical compilation and coordination.

THE PHILIPPINE NATIONAL ACCOUNTS

General Remarks

The basis for the present national accounts framework in the Philippines is the national income and expenditure estimates for 1946-1951 compiled in 1952 by William C. Abraham of the United Nations, in collaboration with the Department of Economic Research of the Central Bank. (1) Responsibility for compiling the accounts was transferred in 1957 from the Central Bank to the National Income Branch of OSCAS (Office of Statistical Coordination and Standards) of the National Economic Council, with which it currently resides.

The keystone of the Philippine national accounts as at present compiled is the national income estimate obtained as the sum total of estimated value added (income originating) in each economic branch. To this estimate of national income at factor cost are added separately estimated values for net indirect taxes and depreciation allowances in order to arrive at the estimate of the gross national product at market prices. Separate estimates are also compiled of government consumption expenditure and gross domestic capital formation. No direct estimate is made of private consumption expenditure, which is derived *in toto* as a residual i. e. as the difference between the sum of the gross national product at market prices and imports net of exports on the one hand, and the sum of government consumption expenditure and gross domestic capital formation on the other.

Any attempt to assess the adequacy of these estimates" ... as measures of economic performance and as guides to policy and planning" involves examination from at least three major viewpoints:

(a) the absolute orders of magnitude of the estimates

(b) short-term changes and fluctuations

(c) secular trend

For purposes of analyzing the relationships and interrelationships between the various national aggregates (such as between domestic capital formation and national saving, private consumption expenditure and disposable income, government consumption expenditure and the gross national product, etc.) - great importance naturally attaches to the degree of accuracy of the absolute values themselves, i.e., to the orders of magnitude of the estimates. This is also the case when the estimates for a particular year are being used as a basis for projections of national income and expenditure into the future, seeing that even with identical assumptions, changes in the relative weights of the various aggregates in the base year will often affect the net picture obtained for future years.

---

(1) "The National Income of the Philippines and its Distribution", by William C. Abraham, United Nations Technical Assistance Program, New York, 1952.

Because of the estimating procedures and assumptions employed it must be deemed doubtful whether the absolute orders of magnitude given by the present national accounts even of the main national aggregates, are of a sufficient degree of accuracy for most purposes of analysis and projection. These procedures and assumptions are discussed in some detail in the following pages. It will only be remarked here that the estimates of national income, depreciation and domestic capital formation are obtained in the main as extrapolations of the 1946-1951 estimates prepared by W. E. Abraham and/or on the basis of substantially the same framework of assumptions as then employed. The extrapolators used, moreover, would appear in most cases to be of very dubious reliability. Ceteris paribus, it follows that the estimates for later years probably incorporate a cumulatively greater margin of error than those for earlier years, seeing that they are progressively further removed from the base year. In particular, the estimates of private consumption expenditure and the various components of gross saving, which are derived as residuals and incorporate the net error implicit in the entire national accounts framework, must be regarded as largely lacking in significance.

For reasons similar to those already outlined, the short-term changes and fluctuations reflected in the accounts (i. e. the year to year increases or decreases) must also be regarded as being of low reliability. Technical coefficients such as the percentage of value added in total value of output per branch, or the relative weight of building construction in Manila in total construction in the whole country, naturally undergo gradual change over the years as a result of technical innovations, changes in relative prices, changed geographical distribution of population and investment, etc. Even for purposes of ascertaining secular trend, therefore, the use of fixed coefficients and assumptions relating to a 15-year-removed base year may well yield a distorted picture. However, apart from these factors making for gradual change over the years, other factors of an irregular nature may cause these same coefficients to fluctuate considerably from one year to another. A number of such factors are touched upon in the following pages. As an example, however, it may be mentioned that the percentage of value added in agriculture will tend to fall in years of low yields due to drought, flood, excessive cold, blight, etc. and to rise in particularly bounteous years. As in indicated in the chapter on value added in such years not only fails to express the fluctuation adequately but actually operates in the direction of ironing-out the fluctuations.

As has already been stated, the assumption of fixed coefficients for estimating purposes also has its dangers for ascertaining secular trend. The dangers will normally be smaller, however, provided the coefficients are updated from time to time on the basis of ad-hoc surveys or information obtained from other sources. In the case of the present accounts, there is reason to believe that the 1948 coefficients and assumptions still employed are in many cases no longer relevant or applicable. If to this is added the effect of the imperfections inherent in many of the extrapolators used, there would appear to be considerable room for doubt as to the accuracy of the picture obtained from the accounts of the overall development of the Philippine economy during the past decade. In particular, and on the basis also of other indicators, there are grounds for believing that the real rate of growth of the gross national product since 1955 has been greater, and perhaps considerably so, than is indicated by the official estimates.

NATIONAL INCOME ACCOUNT

Total National Income

The estimate of total national income is obtained by aggregating the estimates of value added (income originating) in each economic branch.

With the exception of the Government sector, value added is estimated for all branches globally. No separate estimates are made of the factor payments (compensation of employees, interest, rent and net profits) which comprise total value added in each branch.

In practically all cases value added is obtained, explicitly or implicitly, as the difference between the value of gross output and non-factor operating expenses. The estimates of gross output (other than agricultural output) are themselves very rough. At the same time, non-factor operating expenses are not estimated directly but are assumed to constitute fixed percentages of the value of gross output in the various branches. The percentage employed are in almost all branches the same as those originally determined for 1948 by W. C. Abraham.

In view of the deepening of production and the technological changes in production processes that have occurred since 1948, as also the differing trends of input and output prices during the same period, there is every reason to believe that the use of those 1948 percentages must seriously distort the picture obtained of the absolute level of the total national income and value added by branch, as also of the year to year changes and development over time. This is in addition, moreover, to the wide margin of error implicit in the gross output figures to which the fixed cost ratios are applied.

Certain of the biasses and errors contained in the individual estimates may, of course, cancel out in the process of aggregation. It is also possible, although most improbable, that the extent of mutual cancellation of errors is such that the net figures ultimately obtained nevertheless give a tolerably faithful picture of the actual situation and developments. This, however, is more a question of luck than of statistics -- failing luck of this sort, it may be stated with confidence that the methods and sources at present employed for national income estimation are not such as to guarantee estimates of even a minimum standard of reliability.

A brief summary and critique of the sources and estimating methods employed for the major branches is given below under "Value Added by Branch".

National Income by Factor Shares

As indicated, value added is estimated for each branch globally, so that no direct estimates of factor payments are available. The figure for total national income, obtained as the sum of value added in the various branches, is however broken down into the following categories:

(1) Compensation of employees

  (a) agriculture
  (b) other branches

(2) Entrepreneurial and property income of persons

  (a) agriculture
  (b) other branches

(3) Private corporate income

(4) Property income of government

(5) Total national income

The breakdown is effected, however, not on the basis of direct measurement but on the basis of fixed percentages similarly dating back to 1948. The procedure employed may be summarized as follows:

(a) Separate estimates are first prepared of private corporate income (3) and property income of government (4).

(b) These estimates are then deducted from the figure for total national income (5) in order to obtain as a residual the estimate of total income accruing to households i.e. the sum of items (1) and (2).

(c) This residual estimate is thereupon broken down into "compensation of employees" (1) and "entrepreneurial and property income of persons" (2) on the basis of the fixed 1948 ratio of 44% for compensation of employees and 56% for entrepreneurial and property income of persons.

(d) The estimates of both compensation of employees and entrepreneurial and property income of persons are the further broken down into "agriculture" and "other branches." This is done by firstly breaking down the global estimate of value added in agriculture on the basis of the fixed 1948 ratio: 28% for compensation of employees 72% for entrepreneurial and property income of persons. This gives items (1.a) and (2.a) respectively. The estimates for "other branches" i.e. items (1.b) and (2.b) are then derived as residuals.

For purposes of ascertaining approximate orders of magnitude, the use of fixed ratios, provided they are not excessively outdated, may perhaps be regarded as acceptable procedure. However, for measuring year to year changes, the same procedure must be regarded as extremely dubious and this even if the ratios date back a few years only.

Under the circumstances, the use in the present accounts of fixed 1948 ratios for breaking down household income into factor shares must be regarded as introducing so wide a possible margin of error into the estimates as to largely destroy their significance, particularly from the point of view of development over time but also from that of the absolute magnitudes themselves. This is because the changes that have presumably occurred in the Philippines over the past 15 years in production patterns, technology and capital intensivity, together with the changes in relative wage, interest and profit rates and prices in general, must have rendered the 1948 ratios largely inapplicable to the present situation.

It should also be pointed out that the figure for "property income of government", which comprises the net profits of government corporations, has not in fact been included in either of the branch estimates of value added, and is therefore excluded from the estimate of total national income obtained by aggregating value added in all branches. (See also "National Income by Factor Shares" below). By deducting these profits from the estimate obtained of household income is, ceteris paribus, understated to the same amount.

A further weakness is that the item "private corporate income", which is deducted in order to obtain household income, is itself a fixed ratio estimate. In principle, this item consists of the undistributed profits of private corporations and corporate profits taxes paid. However, in the absence of direct information on undistributed corporate profits, they are estimated as a fixed 74% of corporate net income after deduction of corporate taxes. The source of this fixed percentage is unclear. But the important point is that the very assumption of a fixed ratio surely amounts to begging the question. For it is precisely the fluctuations and trend of these profits that are of interest for economic analysis.

Value Added by Branch

1. Agriculture

The value of agricultural output is estimated each year from the results of the annual Crop and Livestock Surveys of the Bureau of Agricultural Economics and from data obtained from other bureaus of the Department of Agriculture and Natural Resources. The reliability of the Crop and Livestock Surveys is discussed elsewhere. However, seeing that the Surveys cover agricultural production by farm-households only, global adjustments are made to take account of other agricultural production (see "Crop and Livestock Surveys"). The adjustments are made on the basis of fixed coefficients derived from the 1948 Census of Agriculture.

In practice, only crop and livestock inventory are valued at prices actually received by farmers. Fishery, forestry, livestock and poultry products (except pork, carabao, and horse meat) are valued at consumer prices. No deduction is made for wholesale and retail trading margins, with the result that these margins are included, implicitly, in farm income.

No direct estimates of non-factor production costs have been compiled since the 1948 estimates prepared W. C. Abraham. The estimate of gross value added by the branch is thus obtained by deducting these same percentage costs from the estimated value of output of each major crop and livestock item. These cost percentages do not include allowances for depreciation of farm buildings and equipment, and further global deduction on this account is made at the fixed rate of 2.66 per cent of gross value added in the sector. This percentage is presumably the same as that employed for 1948.

Both for long-run and short-run analysis, the use of fixed 1948 cost ratios for deriving value added in agriculture almost certainly introduces into the estimates errors of most serious nature-- and these in addition to those outlined previously. In all countries, agricultural techniques and technical input patterns are subject to change over the years. In the Philippines in particular, the change over the past 15 years has presumably been considerable, with growing trend towards increased purchases of inputs such as fertilizers, insecticides, etc. from other sectors. This presumption would appear to be borne out by the tentatively revised cost ratios for 1959 prepared by the Economic Research Department of the Central Bank. While the calculations are not final, a clear upward trend is discernible in the cost ratios for most crop and livestock items, as compared with the 1948 ratios now employed.

Other things remaining equal, therefore, the continued application of the 1948 cost ratios means that the estimates of value added in the branch in recent years are overstated.

For short-run analysis, the use of fixed cost ratios may lead to even more serous distortion -- and this even when technical input patterns are not undergoing change. This may coke about as the result of irregular short-run fluctuations in average physical yields, due to climatic or other factors such as drought, excessive rain or cold, pests, etc. In such years the same value of inputs will normally constitute a higher percentage of the reduced value of agricultural output than in normal years. As a result, the use of the lower cost ratios applicable to normal years will lead to overstatement of agricultural income (value added) in the current year. The opposite will be the case, of course, for years with exceptionally bounteous yields. It is apparent, therefore, that the present method must tend towards ironing out and minimizing the year to year fluctuations actually occurring in income originating in the branch. However, it is precisely these fluctuations that are of interest to policy makers and analyst.

Another factor contributing to both short and long-run modifications in cost ratios is the changes occuring in the "terms of trade" of the agricultural sector vis-a-vis other domestic and foreign sectors. The present cost ratios were calculated on the bas's of the relative output and input prices ruling in 1948. Any subsequent changes in these relative prices would consequently imply changed cost ratios also. The assumption of fixed ratios by-passes this problem, and undoubtedly constitutes an additional source of error in the estimates.

2. Manufacturing

Up to and including 1960, the value of gross output in manufacturing was obtained as the product of the estimated average annual value of output, by branch, and the number of establishments operating each year. From 1961 onwards, the value of gross output has been obtained as extrapolations of the 1960 estimates, on the basis of indexes of physical volume and price.

For the estimates up to and including 1960, average annual value of output, by branch, was calculated from the date reported to the Central Bank by the 800 cooperating firms (2000 establishments) constituting the basis of the Index of Manufacturing Production. The degree of representativeness of these cooperating establishments and the reliability of the data reported is discussed elsewhere (see: "Index of Manufacturing"). Suffice it to reiterate here that they do not constitute a probability sample, and that there is excessive representation of establishments in the Manila area and of establishments of above-average size. There is little reason to believe, therefore, that the figure of average annual value of output computed from the data supplied by these establishments were representative of manufacturing as a whole.

The estimated numbers of establishments employed for inflating these averages are likewise of extremely doubtful reliability. The source of the data is the list of approximately 8,000 establishments compiled by the Central Bank for 1956, which comprised the frame of reference for the Index of Manufacturing Production. As far as it has been possible to ascertain, this list included in practice mainly establishments with 5 or more workers -- which presumption would appear to be confirmed by the fact that the total number of establishments of this size according to the 1956 Survey of Manufactures was roughly 7,200. If this is the case, then practically no account has been taken in the estimating procedure of the large number of one-man businesses and establishments with 1 - 5 workers. Subsequent to 1956, attempts were made by the Central Bank to update the list of establishments annually. In the absence of information, however, it did not prove possible to correct for establishment "deaths", while scanty and incomplete data only were available on new establishments commencing production.

It is apparent, therefore, that both the absolute level of the gross output estimates and the annual changes recorded in them for the period up to 1960 must be regarded with considerable reserve.

As indicated, the value of gross output from 1961 onwards has been estimated as extrapolations of the estimate obtained, as above, for 1960. The indexes employed for extrapolation are the indexes of the physical volume of manufacturing production and the indexes of wholesale prices -- all of which are compiled by the Economic Research Department of the Central Bank.

The main reason for the change of estimating procedure was to maintain consistency between the series obtained in current and constant prices. Up to 1960, the current price series was estimated directly, as outlined above, while the constant price series was calculated on the basis of the index of the physical volume of manufacturing production. As a result, the implicit price index derived from these two series embodied the errors of both, and apparently differed considerably from the wholesale price indexes compiled directly from other sources.

Apart from the consistency now achieved, however, it is by no means clear that the estimates of gross output themselves, obtained by the new method, are more accurate than those obtained by the former method. Seeing that the starting point for the new series is the unadjusted 1960 estimate, any error in the absolute level of the former series is automatically carried over into the new series. At the same time, the index of manufacturing volume employed for extrapolating itself suffers from a number of serious defects that are discussed elsewhere (see:"Index of Manufacturing"). Similarly, the wholesale price indexes employed do not necessarily reflect the trend of prices actually received by manufacturers.

The estimates of value added in manufacturing are derived by applying to the estimates of gross value of output, calculated as above, fixed cost ratios dating back in most cases to the 1946-1951 estimates prepared by W. C. Abraham. In view of the technological changes that must have occurred in manufacturing processes since 1948, and also the differing trends of input and output prices, wage and profit rates, etc. - the use of these ratios must seriously distort the picture of development over the years. Moreover, the use of this method rules out in advance any possibility of discerning irregular conjunctural fluctuations from one year to another, which are reflected in changed profit levels and, consequently, in value added as percentage of gross output.

In the circumstances, it would seem better for national income purposes to make use of the annual Surveys of Manufactures. Despite limitations of coverage (see "Surveys of Manufactures"), they would appear to offer a far firmer basis for estimating purposes than the sources at present employed.

Following is a comparison of the 1948 percentages of value added at present employed, with those implicit in the 1960 Survey of Manufacturing. [It should be pointed out that the Surveys of Manufactures cover establishments with 5 or more workers only, whereas the 1948 value added estimates relate in principle to all manufacturing establishments. The value added percentages derived from the Survey may therefore be expected, coteris paribus, to be smaller than those for all establishments; particularly in branches in which small scale production is prevalent. On the other hand, the Survey estimates of value added include, in addition to factor payments, general and miscellaneous expenses also. To this extent, therefore, they are biassed upwards as compared with the 1948 percentages. Taking this into account, however, the differences between the two sets of percentages would still appear in most cases to be too large to be explained by these factors.]

Percentages of Value Added in Manufacturing

	1948	1960 Survey of Manufactures
Food	59	45
Beverages	44	63
Tobacco	80	47
Textiles	72	36
Footwear and wearing apparel	81	36

	1948	1960 Survey of Manufactures
Paper and Paper products	58	38
Printing and publishing	63	54
Leather and leather products	74	36
Rubber products	75	47
Chemicals and chemical products	69	39
Wood and cork (except furniture and fixtures)	67	42
Furniture and fixtures	64	46
Basic metal products	69	44
Metal products (except machinery and transport equipment)	69	42
Machinery (except electrical machinery)	44	77
Electrical machinery and appliances and supplies	78	48
Transport equipment	79	37

3. Mining

The estimate of gross value of mineral production is supplied by the Bureau of Mines. Coverage is thought to be about 80 - 85% of total production, with under coverage mainly confined to non-metallic minerals. No upward adjustments are made on this account for national income purposes.

Value added in the branch is derived by applying a single (presumably base-weighted) cost ratio to the aggregate gross value of all mineral production. The ratio was calculated for 1959 from questionaire data supplied by mining companies.

Seeing that value added in mining amounts to less than 2% of the total national income, the effect of the error in this estimate on the overall national accounts will be comparatively small. In principle, however, it should be pointed out that the limitations outlined previously with regard to the use of fixed cost ratios are equally relevant to the mining branch.

4. Construction

The estimate of value added in construction is very defective and is apparently understated considerably. Owing to the existence of what appear to be partly compensating errors in the assumptions employed for estimating gross value of construction and operating expenses, the net degree of understatement is less than would otherwise have been the case. However, the year to year changes and the picture obtained of development over time are probably greatly distorted.

The estimate of the total gross value of construction is obtained as the sum of "private construction" and "other construction", and is identical with the construction component of gross capital formation.

The value of private construction in the whole country (including both residential and non-residential structures) is estimated globally on the basis of the estimated value of similar construction in the Manila area, it being assumed that construction in the Manila area constitutes a fixed 30 percent of total private construction. This is the same assumption employed by W. C. Abraham for compiling the 1948 estimates. For unapparent reasons, no use is made of the data available (with all their limitations) on construction value in 29 other chartered cities and 4 municipalities.

The arbitrary application of the 30 percent ratio for a period of some 15 years is in itself more than sufficient to raise the most serious doubts as to the reliability of the global estimates obtained, particularly those for more recent years which may be very much off the mark. A number of other estimating deficiencies also exist, however, which are deserving of mention.

The source of the data on construction in the Manila area is the quarterly tabulations of the Bureau of the Census and Statistics on permit value of construction. The serious limitations of these data are outlined under "Private Construction Statistics". It should be reiterated,here, however, that precisely in the Manila area the average square metre prices employed for calculating permit value from permit area construction have been maintained virtually unchanged for many years. The current price figures for Manila, which are used as a basis for estimating the value of construction in the entire country, are thus themselves biassed downwards to the same extent that building costs and prices have risen over the years.

From 1960 onwards, an attempt has been made to correct the average square metre prices employed by adjusting them upwards in accordance with the rise in the sub-index "construction materials" of the "Retail Price Index of Selected Commodities in Manila" compiled by the Central Bank. This correction, however, does not entirely remedy the situation. In the first place, the starting prices to which the index of "construction materials" is applied remain those for 1959, so that the cumulative understatement to that date is explicitly carried forward into the new series beginning 1960. Secondly, the index of "construction materials" is a retail index and does not necessarily reflect the trend of prices paid by building contractors. Thirdly, the "basket"of this sub-index, being a retail index, does not include what is the most important single building cost item i.e. labour.

A further point which should be made is that the corrections introduced as from 1960 have broken the historical series, so that it no longer gives a statistically consistent picture of development in past years.

"Other construction" comprises central and local government expenditure on public buildings, roads, irrigation systems, ports, airports, river control, drainage, etc., together with construction expenditure by government corporations, NEC - AID development projects and the farm sector. The data for central and local government expenditure are taken from the annual reports of the General Auditing Office, while those relating to NEC - AID projects and government corporations are obtained directly from the organizations concerned. The estimates are therefore presumably firm; although as is often the case with regard to capital formation expenditures derived from accounting records, the question remains open as to whether the data are recorded on a cash or accrual basis. In cases of large projects involving heavy expenditures over a period of years, this consideration may be of crucial importance for determining actual capital formation in a given year. It should be pointed out, however, that owing to an apparent oversight the overwhelming bulk of capital expenditure by local government has been omitted in all years from the estimates. In 1960, this expenditure amounted to some 30 million pesos.

In respect of farm construction, a fixed global investment expenditure of 10 million pesos is assumed annually. This is the same figure used by W. C. Abraham for the 1948 estimates. In view of the considerable changes that have presumably occurred in the interval in the volume and pattern of farm investment, the present fixed estimate must be regarded as lacking significance for analytical purposes.

Value added in the construction branch is taken for all years to be 68 per cent of the gross value of construction, estimated as above. The source of this percentage is not clear, although it is close to the figure of 72 per cent implicit in the Abraham estimate for 1948. There are grounds for believing, on the basis of both views expressed by domestic contractors and experience in other countries, that the figure of 68 per cent value added (i.e. 32 per cent only non-factor costs) is excessively high. As pointed out, this tends to offset to some extent the influence of the understatement in the estimated gross value of construction on the derived estimates of value added.

It should also be mentioned that, in the construction branch in particular, the distorting effect of a fixed value added ration on the resulting picture of year to year change may be especially great. This is because of the fact that the percentage of value added in the branch is subject not only to secular change as a result of technological innovations, but also to short term fluctuations arising out of conjuntural changes which may markedly influence the level of profits.

5. Transportation and Communication

This branch is defined to include public utilities but to exclude government enterprises and corporations engaged in transportation and communication activities such as the Bureau of Posts and the Philippine Air Lines. These latter are included in value added in the Government sector. Both in the case of public utilities and government enterprises and corporations this treatment is contrary to U. N. recommendations, and would also appear to serve no useful purpose.

The estimates of value added for the past 15 years are essentially extrapolations of the 1948 estimate prepared by W. C. Abraham. No independent and direct measurement has apparently been made since then. Seeing that extrapolation is made on the basis of what are in principle indicators of the trend of gross output, this method of calculation too implicitly assumes that value added remains a fixed percentage of the value of output over the years.

Up to and including 1957, extrapolation was made on the basis of the appropriate sub-index of the gross sales index compiled by the Central Bank. Following the discontinuation of this index after 1957, the estimates for 1958 onwards are extrapolations of the 1957 estimate on the basis of composite indexes of "volume" and "price". These indexes are derived, respectively, from the indexes of employment and average monthly earnings compiled by the Central Bank, by re-weighting the sub-indexes for "transportation and communication" and "electricity, gas, heating, water and sanitation".

Even assuming the availability of adequately refined and sensitive indexes of gross sales or output, the reliability of estimates obtained as extrapolations of a 15-year removed benchmark would, in the best of circumstances, have to be rated as extremely doubtful. In a branch such as transportation and communication, which is composed of numerous sub-branches, the probable margin of error is even greater. The reliability of the gross sales index used for extrapolation up to and including 1957 is at present unknown. A number of defects may be indicated, however, in the method of extrapolation and in the indexes of employment and average monthly earnings used for extrapolating subsequent to 1957.

In the first place, the "cooperating establishments" supplying the data for the compilation of both indexes do not constitute probability samples -- so that the extent to which they reflect actual trends in these branches remains unknown. Secondly, the number of "cooperating establishments" has remained constant since 1955, and no account has been taken in compiling the indexes of the new establishments that began production subsequent to this date. As regards the average earnings index, the effect of this may not perhaps be great. In the case of the employment index, however, the effect must be, ceteris paribus, the impartation of a downward bias. Thirdly, there is no necessity that the trend of gross output in the branch is identical with that of aggregate wage payments, as is in essence assumed.

6. Government Sector

For national income purposes, this sector is defined to include, in addition to government agencies at the central and local level, all government enterprises and corporations, such as the Bureau of Posts and the Philippine Air Lines. This approach differs from that of the Statistical Office of the U. N., which distinguishes between "agencies" providing non-specific services on a non-business basis and "enterprises" providing specific services on a more or less business basis. These enterprises should normally be excluded from the government sector and classified in the economic branches to which they belong.

Value added in the Government sector is defined to comprise compensation of employees only. The data for both central and local government are obtained, on a fiscal year basis, from the annual reports of the General Auditing Office, and may be taken to be firm. Those for government corporations are received from them directly.

The inclusion in value added of compensation of employees only calls for the following comments:

Firstly, rent payments by government for office or other accommodation constitute current operating costs and should thus be included in the estimates of both value added and government consumption expenditure. In practice, they are included in consumption expenditure but excluded from value added. This is an inconsistency that should be corrected in order to ensure a proper balancing of the accounts. The total sum of rent payments by central and local government amounted in 1961 to some 5-1/2 million pesos.

Secondly, the net operating profits of government corporations are omitted from value added in the branch and, consequently, from the aggregate estimate of national income. At the same time, these profits are deducted in the national income account by factor shares, in order to obtain the residual estimate of household income (see "National Income by Factor Shares" above). This is a further inconsistency requiring correction.

The calendar year estimates of compensation of employees are derived by averaging the data for two consecutive fiscal years. For years in which government wage and salary scales remain stable, the error implicit in this method is probably not very great. Under conditions of rising wage scales, however, the error may become considerable.

The preliminary estimate of value added (compensation of employees) in the government sector for a given calendar year is obtained by assuming the same absolute increase over the previous year as was recorded in the previous year over the year before i. e. if compensation of employees in 1962 totalled, for example, 10 million pesos more than in 1961, then the preliminary estimate for 1963 would be taken to be equal to the 1962 figure for compensation of employees plus 10 million pesos. The use of such an estimating procedure may perhaps be permissible, in the absence of other data, with regard to small and unimportant components of the national income. Its employment for estimating value added in the entire government sector, which accounts for some 9 per cent of the total national income, must however be ruled out as incompatible with even minimum standards of reliability.

7. Trade

This branch is defined to include, apart from wholesale and retail trade, also banks and other financial institutions and real estate firms. Since the compilation of the 1946-1951 estimates, no direct measurement has been made of value added in the branch, and the estimates for all subsequent years have been obtained as extrapolations.

Up to and including 1957, extrapolation was made according to the Central Bank gross sales index. Following the discontinuation of this index, extrapolation as from 1958 has been made on the basis of the combined trend of value added in manufacturing, mining and agriculture plus the net balance of merchandise trade. The extrapolation is made globally, without reference to sub-branches.

The limitations of estimates obtained as global extrapolations over a period of 15 years have been indicated above under "Transportation and Communications". In particular, the extrapolator used from 1958 must be regarded as excessively crude for estimating value added in a branch accounting in recent years for some 12 per cent of the total national income. Normally, an extrapolator of this sort would be employed for obtaining preliminary estimates only, pending the availability of data from other sources. In general, the estimates of value added obtained must be regarded as being of very low reliability, from the point of view of both absolute level and year to year changes.

In the light of this situation, there would appear to be no good reason why value added at least in banks and financial institutions should not be estimated separately. The requisite data should presumably be available in the consolidated financial statements of these institutions, prepared by the Inspector of Banks.

8. Educational Services

This branch includes, in principle, all non-government educational institutions (including church schools) operating on a business basis. The estimates, as from 1956, are calculated as the product of the estimated number of such institutions, by type, and average net income (value added).

Data on the number of educational institutions, broken down into kindergarten, primary, intermediate, secondary, collegiate and special vocational, are obtained annually from the Bureau of Private Schools. These data are presumably firm. For estimating purposes, however, each of these categories is further stratified into sub-groups according to average net income. This is effected by assuming the same percentage distribution within each category as in 1956 -- the last year for which a survey of private schools was carried out.

The error arising out of the assumption of the same percentage distribution, within categories, as in 1956 is perhaps not over-great. The main source of error is to be seen in the fact that the average net income inputed to the estimated number of institutions in each sub-group is the same as that ascertained and employed for 1956. It seems reasonable to assume that, ceteris paribus, nominal net incomes have risen since 1956 together with the rise in school fees and/or the overall price level. Moreover, the average size of the institutions, measured by the number of pupils enrolled and paying fees, may also have increased during the interval together with the increase in population and the growing emphasis on education -- which would also contribute to a higher average net income per institution. There is a strong presumption, therefore, that the estimates for this branch are understated, perhaps very considerably, together with the rate of nominal growth over the years.

9. Professional Services

As from 1956, the estimate of value added in the branch is obtained as the product of the number of professionals in independent practice (accountants, engineers, lawyers, dentists, physicians, nurses, pharmacists, etc.) and average net income for each professional category.

Updated list of the total gross number of qualified professionals, by category, are obtained annually from the Civil Service Commission and the Supreme Court. These lists are then adjusted so as to eliminate "deaths" and professionals not in independent practice. This is done on the basis of fixed percentages dating back to a survey of professional workers carried out in 1956. The number of persons in independent practice in each professional category (estimated as above) is further divided into two strata i. e. high and low average net income, also on the basis of percentages derived from the 1956 survey.

The error arising out of the use of 1956 percentages for correcting and breaking down the lists of professionals is probably not entirely negligible. However, as in the case of educational services, the main source of error lies in the imputation of 1956 average net income to the various professional sub-groups, for all years. This must impart, ceteris paribus, a considerable downward bias to the estimates and a slower rate of nominal growth than was actually the case.

10. Recreational, Personal and "Other" Services

The estimates for these branches are global extrapolations of the 1948 estimates.

Up to and including 1957, extrapolations was made on the basis of the index of gross sales compiled by the Central Bank. From 1958 onwards, the extrapolators employed are the appropriate sub-indexes of the Central Bank index of employment and the overall index of average monthly earnings of all workers. The estimates obtained must therefore be regarded as extremely crude, both from the point of view of their absolute level and the year to year changes.

In the first place, the index of employment suffers from a downward bias owing to the non-inclusion of new establishments that commenced production subsequent to the base year (1955).

Secondly, the validity of the assumption that the trend of average monthly wages in these branches was identical with that for the economy as a whole is at least doubtful. Thirdly, there is no necessity that the trend of total value added in these branches is consistent with that of wage payments in the same branches -- which is what is implicitly assumed.

11. Net Rental Value of Owner-Occupied Dwellings

The estimate is obtained as the product of the estimated number of owner-occupied dwelling units and average net rent per unit.

The total number of dwelling units in the country is estimated by dividing the estimated total population each year by the average number of persons per household. The population estimates employed are the annual population projections, adjusted of late to the results of the 1960 Census of Population. As from 1960, the average number of persons per household has been taken to be 5.66 i.e. the average of the 1948 Census and 1956 household survey figures. Prior to 1960, the figures employed was 5.84. The number of owner-occupied dwelling units is then taken to be 91% of the total number of dwelling units, as per the 1956 household survey.

The estimated number of owner-occupied dwelling units is then broken down into four types of structures according to the materials used in their construction i.e. strong materials, mixed materials, light materials, other. Each of these types is sub-divided into "Manila" and "Provinces", so that a total of 8 sub-groups is obtained. The entire breakdown is effected on the basis of the percentage distribution found in the 1956 Household Survey.

The net rent values for pricing an estimated stock of owner-occupied dwellings in each of the 8 sub-groups are values in each of the sub-groups. The extrapolator for all sub-groups is the rent component of the Central Bank consumer price index for Manila.

In all countries, estimates of net rent are not usually of a high level of reliability and represent mainly orders of magnitude. However, the following deficiencies in the estimating procedure outlined above are worthy of mention.

Firstly, the national income figure should include not only the net rent of owner-occupied dwellings but that of rented accommodation also. This is necessary in order to maintain consistency in the overall national accounts framework, seeing that on the expenditure side the estimate of private consumption expenditure should include, in principle, the total value of accommodation services consumed, regardless of whether the accommodation is owner-occupied or rented. As far as can be ascertained, the net rent of rented accommodation has not been included in the value added of any other branch, so that it should be included in the recent estimate.

Secondly, extrapolation of the 1948 net rent figures over a period of 15 years by the rent index for Manila only must necessarily give rise to a wide margin of error. Also, the percentage of operating costs deductible from gross rents may have changed significantly over the years.

Thirdly, the assumption of a constant density of occupation of dwelling units for estimating the total number of dwelling units in the country really amounts to begging the question, particularly as far as the measurement of year to year changes is concerned.

The use of fixed percentages for breaking down accommodation units by type is in the present circumstances perhaps unavoidable, although it may well constitute an additional source of not inconsiderable error.

The above reservations will gain in importance as and when separate estimates of private consumption expenditure are compiled independently and in detail. In particular, the estimating methods at present employed will not be capable of providing with the desired degree of accuracy information on the real changes occurring in the level of accommodation services enjoyed by the population.

GROSS DOMESTIC CAPITAL FORMATION

Building and Construction Works

The source and methods used for obtaining the estimate of the gross value of construction are discussed together with their reliability, under "Value Added by Branch -- Construction".

The deficiencies outlined may be briefly summarized as follows:

(1) The value of private construction in the whole country is estimated globally on the basis of the assumption that similar construction in Manila constitutes 30 per cent of the national total i.e. the same percentage as in 1948.

(2) The Manila figures comprising the basis for the national estimate are "permit-values" only, and do not necessarily represent work actually carried out. The same Manila figures are also biassed downwards, owing to the system of pricing employed.

(3) Construction expenditure by local government has been almost entirely omitted.

(4) Farm construction is estimated arbitrarily at 10 million pesos per annum i.e. the same figure incorporated in the 1948 estimates.

As a result of these deficiencies, it appears almost certain that the aggregate estimates of construction for the country as a whole are very seriously understated. These estimates are further broken down by industry branch, as follows:

(1) The Manila figures for private construction are already broken down, in the source, by industry branch.

(2) The global estimates of private construction in areas other than Manila (obtained, as above, on the assumption of a fixed ratio of 70 : 30 vis-a-vis the figures for Manila) are broken down into branches on the basis of the relative branch breakdown found in the figures relating to the 29 chartered cities and 4 municipalities, compiled by the Bureau of the Census and Statistics (see "Private Construction Statistics"),

It will be apparent from the above description that the absolute figures of construction expenditure in each branch, obtained by this method, are in all probability well off the mark. They cannot be regarded as possessing the minimum degree of reliability required for analytical and planning purposes.

Machinery and Equipment

This estimate is obtained by the "commodity flow" method-i. e. by aggregating imports and domestic production net of exports -- with appropriate mark-ups and allocation between the various uses. Despite the reservations outlined below, the aggregate estimate at least would appear to be of a minimum acceptable standard of reliability.

The data on imported machinery and equipment, which comprise the large bulk of all machinery and equipment, are taken from the foreign trade statistics and may be presumed to be reasonably firm. It should be pointed out, however, that imported spare parts are apparently recorded in their entirety as capital formation, including parts destined for assembly within the country. Seeing that the value of locally assembled goods, including imported parts, is also included in the estimate of capital formation, this results in a corresponding measure of duplication in the accounts.

The estimates of machinery and equipment originating in domestic production (mainly transportation and agricultural machinery and equipment), which account in recent years for some 10 per cent by value of total investment under this head, appear to be much less reliable. Up to and including 1961, the value of these items was calculated from data on commodity production collected by the Central Bank. It appears, however, that these data were incomplete both as regards coverage and the estimated number of establishments producing each year, so that the estimates obtained must be regarded as deficient as regards both their absolute level and the annual changes recorded in them. As from 1962, the estimates are extrapolations of the 1961 estimate, on the basis of the Central Bank indexes of manufacturing and wholesale prices. Ceteris paribus, however, the index of manufacturing is biassed downwards owing to the fact that it does not take into account production in enterprises established subsequent to 1955 (see "Index of Manufacturing"). Moreover, the sub-indexes compiled relate to commodity groups and not to individual commodities, so that it is assumed in practice that the production of all commodities in a given sub-group has risen to the same extent as the average rise in the sub-group index. The reliability of the individual commodity estimates obtained is consequently not over-great, especially as the wholesale price index used for extrapolation also relates to the composite sub-group "machinery and transport equipment" and not to individual items.

The total availabilities of machinery and equipment, calculated as above, are allocated between consumption and capital formation according to a fixed "allocation key" prepared by the Central Bank for 1955. For more recent years the allocation is likely, therefore, to be very rough. Classification of the capital items (identified as above) by economic branch is made, as in most countries, on the basis of the type and specifications of the machinery or equipment. The classification itself would appear in general to be of an acceptable standard of reliability.

In order to obtain the estimated value of a machinery and equipment at final cost to purchasers, margins of 50 per cent and 25 per cent respectively are added to the value of imported items and domestically produced items, on account of port charges, transportation and installation costs. These margins date back to 1955 and are based on a survey carried out for that year by the Central Bank. Whether or not they are too high can only be determined definitively on the basis of a new survey. In the meantime, if there is any overstatement in these margins it may be taken to compensate somewhat, at least in aggregate, for possible undercoverage.

Changes in Inventories

The calendar year estimates of inventory changes in agriculture (livestock, poultry and sugar) are adapted by straightline interpolation from the crop year estimates of the Bureau of Agricultural Economics and the Sugar Quota Administration. This is the only branch for which inventory changes are measured directly.

In mining, manufacturing and trade, inventories are estimated as fixed (apparently 1955) percentages of gross production or value added. In mining, inventories are taken to be 7.4% of the estimated value of gross production in all years; in manufacturing, 19.8% of total value added; in trade, 2.6% of estimated gross sales.

The assumption of a fixed relationship between the size of inventories and gross production or value added is problematical even for compiling preliminary estimates, when inventory data are usually unavailable. It must be regarded as entirely inadequate for compiling final estimates, seeing that the main point of interest in any analysis of inventory changes is precisely whether this relationship is undergoing change.

GOVERNMENT CONSUMPTION EXPENDITURE

For purposes of estimating consumption expenditures, the government sector is defined to include the Bureaus of Posts and Telecommunications but to exclude government corporations.

The inclusion of the expenditures of these two Bureaus in government consumption expenditure is contrary to U. N. recommendations and offends against the distinction between private and government consumption expenditure. Purchases of postal and telecommunication services by households constitute private consumption, whereas similar purchases by enterprises constitute current inputs to production. The procedure at present followed results both in a confusion of private with government consumption and in duplication in the accounts to the amount of business purchases of these services.

The requisite data for estimating government consumption expenditure are taken in their entirety from the summary tables included in the annual reports of the General Auditing Office. These tables classify, in summarized form, all national government expenditure from the three major funds (general, special and bond funds) together with those of local government.

The classification system used for national government expenditure appears, with one major exception, to be generally adapted to national accounts purposes. For local government expenditure a rather different classification is employed, and a global reconciliation only is made by the General Auditing Office for purposes of consolidation.

The major exception relates to expenditures of the armed forces on construction and durable equipment. Such expenditures, according to U. N. recommendations, should be excluded from capital formation and recorded as part of government consumption expenditure (with the sole exception of residential accommodation for regular military personnel). Under the General Auditing Office's classification, however, these expenditures are recorded as capital formation, with the result that government consumption expenditure is correspondingly understated. Moreover, seeing that military expenditures of this nature are not included in the overall estimate of gross capital formation, they are included by implication in the residual private consumption estimate.

A further source of understatement in the estimate of government consumption expenditure would appear to exist in the fact that national government expenditure from the Fiduciary Funds is not included in the summary tables prepared by the General Auditing Office. Total expenditure from this Fund may amount in certain years of several tens of millions of pesos, although a large if not a major part of the sums involved may not necessarily constitute current consumption expenditure but capital outlays or transfer payments.

The preliminary estimate for the most recent calendar year is obtained by assuming the same absolute increase in expenditure as compared with the previous year, as was ascertained in the previous year as compared with the year before (see also "Value Added by Branch - Government Sector"). This procedure does not constitute measurement and must be regarded as seriously inadequate, especially with regard to an aggregate of the size and importance of government consumption expenditure.

DIRECT TAXES

As at present defined, these taxes also include "all taxes levied on the capital or net worth of corporations and cooperatives, " inheritance tax, marriage license and other fees, and fines and court collections.

Taxes on capital or net worth, together with inheritance taxes, do not constitute government claims on current production but claims on existing capital assets. For national accounting purposes, therefore, they should be excluded from direct taxes and current government receipts and recorded as receipts on capital account. This will have the effect, ceteris paribus, of raising the figure for private saving and of reducing to an equal extent the figure for government saving.

Marriage license fees, fines and court collections should preferrably be classified as current transfers to government. "Other fees" may constitute transfers or indirect tax payments, according to the nature of the items involved.

PROPERTY INCOME OF GOVERNMENT

This item consists of the profits of government corporations, other than those whose profits are treated as indirect taxes. Losses are netted out.

The current surplus of the GSIS (i.e. the excess of premium income, interest, etc. over claims and operating expenses) is also included under this head as property income of government. This would appear to be mistaken, as most of this surplus need not represent profit at all (which may only be ascertained on an actuarial basis) but increases in the savings funds of contributors. Thus, government saving is implicitly credited with sums which would be more appropriately recorded as private saving. In 1963, the GSIS surplus included in property income of government amounted to 17 million pesos.

In principle, the current surplus of the SSS is also included in property income of government. In practice, however, this is not the case owing to failure to obtain the requisite data.

The simplest solution to this problem would perhaps be to regard the GSIS and the SSS as ordinary government agencies and thus as part of the general government sector instead of regarding them as government corporations as at the present time.

INDIRECT TAXES AND SUBSIDIES

The definitions of indirect taxes and subsidies followed are generally those of Statistical Office of the U. N.

The profits of the Bureau of Posts and Telecommunications are recorded as indirect taxes, together with those of the following government corporations (deficits are recorded as subsidies):

Abaca Corporation of the Philippines
Cebu Portland Cement Company
National Marketing Corporation
National Development Company
Philippine Tobacco Administration
Philippine Virginia Tobacco Administration
Rice and Corn Administration

The revised estimates, based on complete data, may presumably be taken as firm. The preliminary estimates are obtained, however, on the basis of the same assumptions employed for government consumption expenditure and value added in government. The method employed must be regarded as inadequate.

CURRENT TRANSFERS TO HOUSEHOLDS AND NON-PROFIT INSTITUTIONS

These payments by Government are taken as equal to item of 10 of the General Auditing Office's classification "grants, subsidies and contributions."

Inspection reveals, however, that this item includes in addition to current transfers, transfers for capital purposes and transfers to abroad to the U. N. and other international organizations. The estimate is therefore overstated, possibly considerably.

The preliminary estimates are obtained on the basis of the same assumptions employed for government consumption expenditure and value added in government. The method employed must be regarded as inadequate.

DEPRECIATION ALLOWANCES

No current estimate is made of the value of depreciation on construction. Instead, a fixed global allowance is assumed of 230 million pesos annually (180 million for residential structures and 50 million for non-residential structures). These allowances are identical with those estimated by W. C. Abraham for the year 1948.

These allowances must be regarded as lacking in significance for current analytical purposes. The population of the Philippines rose by some 50 per cent between 1948 and 1963, so that even without allowing for price or quality increases the current depreciation estimate for residential structures should presumably be higher by at least something of the same order of magnitude - especially as the available evidence points towards a decrease in the average density of persons or accommodation unit since 1948 (see "Value Added by Branch - Net Rental Value of Owner-Occupied Dwellings"). As for non-residential structures i.e. for business and industrial purposes etc., the physical stock of such structures must have increased very considerably since 1948, both in number and average size, so that this estimate too is almost certainly understated drastically. Needless to say, the assumption of fixed allowances also rules out in advance all possibility of obtaining a picture of development over time.

In principle, depreciation of machinery and equipment is estimated at replacement cost by the "perpetual inventory" method. For this purpose, the average economic life of machinery and equipment in the Philippines is taken to be 10 years, which is the same assumption employed for compiling the 1948 estimates.

As a first step, the value of gross domestic investment in machinery and equipment in each of the previous 10 years is converted into current year prices for imported durable equipment, compiled by the Central Bank. The aggregated value of this investment during the previous 10 years then gives the value in current prices, gross of depreciation, of the existing stock of machinery and equipment in the country. The annual value of depreciation is taken as 10 per cent of this aggregated value.

The accuracy of the depreciation estimates naturally depends in the first place on the accuracy of the underlying capital formation estimates for machinery and equipment. This has been discussed under "Gross Domestic Capital Formation." A source of weakness in estimating procedure employed is the global assumption of average economic life of 10 years for all items of machinery and equipment. The variance around this "average" may in fact be considerable. The distorting effect of this assumption will be greater in economies in which the annual level and composition of investment is undergoing change, than in economies in which the level and composition of investment remains stable.

REST OF WORLD ACCOUNT

The data in the Rest of World Account are taken in their entirety from the Balance of Payments Current Account prepared by the Central Bank. No corrections or adjustments are made to the figures on account of the limitations of these data, which are outlined under "National Balance of Payments."

It should be reiterated here that imports of the armed forces-have been omitted, apparently in their entirety, from the balance of payments, while most of the services items would appear to be of a low order of reliability.

Following the balance of payments, the receipts side of the Rest of World Account includes the item "Net donations to the Philippines", which comprises all transfer payments received from abroad by the Philippine Government and the private sector. No distinction is made between transfers received on capital or current account, so that Japanese Reparations for example appear as current receipts both in the Rest of World Account and, as a corrollary, in the Government Sector Account. This treatment results, ceteris paribus, in an exaggerated picture of government saving and understatement of capital import from abroad.

In view of these limitations, the balancing item in the Rest of World Account i.e. "net lending abroad" must be regarded as of dubious accuracy. Seeing that this item measures the extent of capital export or import into the economy, this constitutes a serious gap in economic knowledge.

CAPITAL AND SAVINGS ACCOUNT

This account distinguishes three categories of savings: private savings, government savings and depreciation allowances. The sum of these three categories equals gross national savings, which are again equal by definition to the sum of gross domestic capital formation and net lending abroad (surplus in Rest of World Account).

As has been indicated under "Gross Domestic Capital Formation", there is strong reason to believe that the capital formation estimates are very considerably understated. Seeing that gross national saving is conceptually equal to the sum of gross domestic capital formation and net lending abroad, it follows that the estimates of gross national saving must be understated, ceteris paribus, to the same extent as those for domestic capital formation. The size of the derived estimate of savings is also influenced by the accuracy of the estimate of capital export i.e. net lending abroad. As indicated under "Rest of World Account", this item too is of dubious reliability, although it is not possible at the present stage to assess the size or direction of the net error involved.

On the savings side of the account, the only item estimated with a minimum acceptable degree of accuracy is "government savings" - although here too the estimating procedures and classification schemes employed detract considerably from the reliability of the estimates (see: "Government Consumption Expenditure," "Property Income of Government," "Direct Taxes," Current Transfers to Households and Non-Profit Institutions" and "Rest of World Account").

Conceptually and (in the present accounts) in practice, the estimate of private savings is derived by one of the following two methods, which are in principle identical:

(a) by deducting from the sum of gross capital formation and net lending abroad (i.e. from total gross savings) the independent estimates of government savings and depreciation allowances, or

(b) as the difference between estimated disposable income and private consumption expenditure -- with the latter item being derived at present as as residual in the national accounts framework.

From both points of view, the estimate of private savings is seen to be a residual item embodying the net errors implicit in the entire national accounts framework. It must be regarded, therefore, as lacking all significance and usefulness for analytical purposes. It is evident moreover, that the global understatement in total gross national savings is not to be imputed in its entirety to private savings alone. This is because the third component of gross savings i.e. "depreciation" is itself seriously understated (see: "Depreciation Allowances").

In summary, the capital and savings account, as at present compiled, cannot be regarded as constituting a tool of analysis or planning. The probable margin of error inherent in most of the component item is so great as to nullify their significance -- both as regards orders of magnitude and development over time.

CROP AND LIVESTOCK SURVEYS

The Crop and Livestock Surveys are carried out annually by the Bureau of Agricultural Economics of the Department of Agriculture and Natural Resources.

The Surveys are designed primarily to measure palay areas, production and stocks; although detailed information is also collected and compiled for most other crop and livestock items.

The sample employed for the 1963 Survey was a multi-stage sample comprising 6,147 farm-households selected from 1,172 sample barrios. Given the objectives of the Surveys, the sample design developed would appear to represent an effective and efficient exploitation of budget availabilities. However, this is not in itself sufficient to ensure that the survey results are of the required standard of reliability.

Coefficients of variation have been calculated only respect of palay production in 1962. The coefficient obtained for the country as a whole was 3.39% while at the regional level the figure was something less than 10%. Seeing that the sample was designed specifically with a view to obtaining maximum accuracy for palay, the coefficients of variation for other crop and livestock items, although unknown, must certainly be very much greater. In many cases, the possible error may be so large as to render doubtful the significance of the annual changes in these items, as revealed by the Surveys.

From the point of view of coeffients of variation, therefore, the present sample size and design yield what are perhaps tolerably accurate results for palay production as a whole, but less than satisfactory results for production at the regional level. For most other items, the sample size and design must be regarded as inadequate. [The Bureau of Agricultural Economics is now planning the substitution of four quarterly surveys for the single annual survey carried out to date. The proposed sample size and design will vary from province to province. so as to ensure proper representation for all main crop and livestock items. Unfortunately, the pre-test due to be carried out during the 1963/64 fiscal year has had to be postponed owing to lack of budgets.]

As indicated, however, improved sample design will not in itself ensure estimates of the required standard of reliability. A fundamental weakness of the present estimates is that they are based exclusively on data supplied by farm-households, and not on objective measurement. Considerable efforts are made to extend proper training to the enumerators visiting the farm-households, who are also equipped with a well designed "Reference Manual for Interviewers". However, in countries such as the Philippines, where no accounts or records are maintained by the large majority of farms, the enumerators have inevitably to rely on the memory of farmers for most of the data required for filling out the questionnaires. A wide area of uncertainty thus exists regarding the probable degree of response error implicit in the replies received.

In the absence of systematic records, the quantities of the various crops produced are reported by farmers from memory. Other things being equal, it follows also that the possibility of error increases with the time that has elapsed since the particular crop was harvested. The value of the crops produced is likewise reported directly by the farmer, from memory. In the large majority of cases the areas under the various crops are estimated by farmers (where necessary, with the assistance of the enumerator) on the basis of seeds and/or cutting sown. Ultimately, this too involves reliance on the farmer's memory. It suffers, moreover, from the further weakness of reliance on norms - which is always problematical.

For these reasons, the area estimates are thought to be weaker than those for production and to be biassed upwards. This may partially explain why the implicit average yields obtained by dividing the survey estimates of production by the corresponding estimates for areas are frequently lower than the average yields estimated from other sources. [In 1959, an attempt was made to check the crop returns for palay only by means of sample crop-cutting. Owing to lack of budgets, however, the data collected has not been compiled and remains unutilized. The provision of budgets to facilitate objective crop measurement on the basis of sample crop cutting would appear to rate high priority - and this not only for palay but for other main crops too. It is also regretable that for similar lack of budgets it has not yet proved possible to carry out a systematic comparison of the average prices implicit in the Survey results with those available from other sources.]

A further weakness of the Surveys relates to coverage. By definition, only agricultural activity carried on by farm-households is covered by the Surveys. However, farm-households are defined as:

(a) household farming a physical 1,000 square meters or more, or

(b) households keeping 20 or more livestock or 100 or more head of poultry.

Moreover, these definition are rigid and no "mixed keys" are applied whereby a household farming, say 800 square metres but also possessing 70 head of poultry would be classified as a farm-household. Such a household, having failed to satisfy one or other of the above criteria, would be classified as a non-farm household and excluded from the survey frame.

No current estimate is available of the probable weight of production by non-farm households in total agricultural production. Information may become available, however, from the forthcoming tabulations of the 1960 Census of Agriculture. According to the 1948 Census of Agriculture, crop production in such households amounted to roughly 3-1/2% of total crop production. The main items affected are probably vegetables, livestock and poultry and, possibly, certain varieties of fruit.

It should also be pointed out that up to 1957, the aggregate estimates for the various survey items were obtained as projections of 1955 bench-mark estimates, according to the annual changes indicated by the sample results. From 1958 onwards, however, the sample results are inflated separately for each year in order to obtain the national aggregates. The annual Survey results thus do not constitute a fully consistent time series.

ANNUAL SURVEYS OF MANUFACTURES

The Surveys of Manufactures have been carried out annually since 1956 by the Bureau of the Census and Statistics. They are designed primarily to provide information on main aggregates such as gross sales, employment, wages and salaries, major inputs, value added etc.

The Surveys cover, in principle, all manufacturing establishments employing five or more workers. Establishments with 20 or more workers are included in the sample with 100% certainty, while a uniform 10% sample is taken of other establishments. For the 1960 Survey, a sample of approximately 2,800 establishments was selected from an estimated total population of some 8,800 establishments.

The sample frame for the 1956 Survey was based on the nationwide registration of all non-agricultural establishments carried out by the Department of Labour for the year 1955. A further such registration was carried out by the same Department for the year 1959. The registrations were based primarily on lists supplied by municipal authorities, supported by on-the-spot investigations in the field.

It seems reasonable to assume that the larger establishments (employing 20 or more workers) were covered more or less completely by these registrations. It is probable, however, that the official lists of smaller establishments are incomplete, perhaps seriously so. To this extent, therefore, the inflated national aggregates will be systematically biassed downwards.

For inter-registration years, efforts were made to update the lists of establishments on the basis of information obtained from government and municipal agencies, and also from newspapers, periodicals, etc. However, in the absence of systematic reporting and follow - up of new establishments beginning production and of existing enterprises closing down, the corrections to the lists are very rough -- particularly in respect of the smaller establishments. [As an indication it may be pointed out that, in practice, about 15% of the establishments, included in the sample selected subsequently prove to have ceased operating.] This means that the net year to year increases in production, employment, etc. in manufacturing as a whole are not reflected fully in the annual survey results.

In all countries, the presumption exists that certain of the data reported by establishments are understated, particularly items such as gross receipts. However, in the situation prevailing in the Philippines, there are grounds for assuming that the degree of understatement is relatively greater -- perhaps more so in the case of smaller establishments which in most cases do not maintain accounting records. This together with the effect of the presumed understatement in the estimated number of smaller establishments, may partially explain the relatively low production figure given for these establishments by the Manufacturing Surveys (less than 10% of the total value of manufacturing production in 1960 originated, according to the Survey, in establishments employing between 5 - 19 workers).

Another factor adding to the probable margin of error is that some 10% of the establishments in the sample fail to return completed questionnaires. For these establishments, imputations are made on the basis of partial indicators, such as employment etc.

For all major national aggregates, the published coefficients of variation of the estimates do not exceed 2%, and in a large number of cases are only 1%. Compared with many other countries, these coefficients are very low indeed, and would appear to indicate that the sample design employed is, in general, statistically adequate. This however, is not incompatible with the existence in the estimates of the biasses due to undercoverage and understatement, mentioned above.

A further weakness of the Surveys, unconnected with statistical methodology, is the exclusion from the survey frame of self-employed persons and establishments with less than 5 workers. In the present stage of economic development of the Philippines, production in such establishments undoubtedly accounts for a high proportion of total production. This is particularly likely to be the case in branches such as bakeries, rice and corn mills, dress making and tailoring, shoe repair shops, woodworking, etc. Similarly, no information is at present available on home and cottage industry.

In their present form, therefore, the Surveys of Manufactures are very far indeeded from reflecting the total volume of manufacturing output in the Philippines. It is also doubtful whether the trend implicit in the annual survey data is closely indicative of the trend of manufacturing activity in the country as a whole.

INDEX OF AGRICULTURAL PRODUCTION

The index of agricultural production is compiled annually by the Research Department of the Central Bank. The data employed are obtained from the relevant Divisions of the Department of Agriculture and Natural Resources.

The aggregate index is obtained by weighting the quantity relatives for the various main commodity groups by 1952 production values. As from 1956, the quantity relatives themselves are calculated on the basis of the 1955 volume of production.

The reliability of the Crop and Livestock Survey data largely underlying the index is discussed separately under "Crop and Livestock Surveys". The reliability of the index as a whole is certainly not enhanced, however, by weighting by 1952 production values -- although rough calculations tend to indicate that with few exceptions the pattern of agricultural production has not changed radically since this date.

The main exceptions are fish, tobacco and sugar cane, the relative weights of which have risen considerably. The effect on the aggregate index is probably not over-great, however.

INDEX OF MANUFACTURING

The Central Bank compiles and publishes a quarterly "Index of the Physical Volume of Production in Manufacturing." Separate indexes are published for over 40 branches and commodity groups. The series has been carried back as far as 1949.

The data for compiling the index are obtained monthly from some 800 firms, comprising about 2,000 establishments. Quarterly indexes only are compiled, however, owing to lack of sufficient resources for carrying out monthly computations.

The indexes are computed as the weighted arithmetical averages of quantity relatives. The weights employed are the relative values of production in the base year (1955). The indexes obtained are therefore Laspeyre indexes.

From the point of view of coverage, the indexes reflect in principle the trend of production in establishments with 5 or more workers. Data are obtained in respect of 577 product series. In practice, however, the indexes would appear to be deficient on a number of major counts which, taken together, may seriously impair their reliability. These deficiencies probably give rise to biasses which, in some cases, may be mutually counteracting. On balance, however, there is a strong presumption that the overall index is biassed downwards, perhaps considerably.

In the first place, the 2,000 establishments at present supplying the data for compiling the index do not constitute a probability sample. When the base of the index was revised in 1956, questionnaires were sent to each of the approximately 8,000 establishments employing 5 or more workers that had been listed. The establishments now supplying data are merely those from which permanent cooperation has been secured, often on the basis of personal visits and contact. This reflect in the fact that some 65% of the cooperating establishments are situated in the greater Manila area i.e. a very much higher percentage than that given by the Surveys of Manufactures for all manufacturing. Apart from this bias in favour of the Manila area, it may also be assumed on the basis of experience in other countries that a disproportionately high number of the cooperating establishments belong to the category of "large establishments".

Secondly, the quantity relatives calculated for the various branches and sub-branches are weighted by value of production and not by value added. In a developing economy in which the pattern and depth of industrial production is undergoing change, this may introduce considerable bias into the index.

Thirdly, the base year values of production actually employed for weighting are not the estimated values of total production in each branch and sub-branch, but those of the 2,000 cooperating establishments themselves. At best, therefore, the resulting index reflects the trend of production in reporting establishments only, which need not be in close correlation at all with that in manufacturing as a whole. A comparison of the 1955 index weights of a number of selected branches with those implicit in the 1956 Survey of Manufactures is as follows:

	1955 (%) Index of Manufacturing	1956 (%) Survey of Manufactures
All Branches	100.0	100
Food Products	15.0	27.5
Beverages	11.6	6.8
Tobacco products	15.8	6.9
Clothing and footwear	4.1	7.7
Wood and cork products (except furniture)	1.5	5.6
Printing and publishing	0.5	2.9
Chemicals	15.4	11.6
Machinery (except electrical)	0.1	1.3

Fourthly, no attempt has been made to incorporate in the index new enterprises established subsequent to the (1955) base year. The index based on the constant sample of 2,000 establishments thus reflects the trend of production only in establishments already operating in 1955. It does not take into account the additional increase in production attributable to the growth in the absolute number of establishments since that date. The depressing effect of this, even on the aggregate index of production, is probably not inconsiderable. For specific branches, the effect may be very pronounced.

A further point which should be mentioned, albeit of minor practical import pending the compilation of monthly indexes, is that no adjustments are made to the monthly production data received, in order to take account of the different number of work-days in the various calendar months.

It is also noteworthy that the degree of response obtained from the cooperating establishments has worsened since the rescinding of foreign exchange controls. At the present time, the preliminary index is compiled on the basis of replies received from usually not more than 60% of these establishments -- the indexes being subsequently revised when more complete data become available. In such cases of non-response, the practice followed is to assume provisionally that production in the current quarter is equal to that reported for the previous quarter. In periods of changing production, this procedure would tend to iron out the monthly and quarterly fluctuations.

In view of the considerable weight of small scale enterprises (i.e. with 1-5 workers) in total manufacturing production in developing countries such as the Philippines, restriction of the sample frame to establishments with 5 or more workers only also limits the accuracy of the index as an indicator of overall manufacturing activity.

INDEX OF MINING PRODUCTION

The index of mining production is computed quarterly by the Research Department of the Central Bank. The requisite data are obtained from the Bureau of the Mines.

The index is said to cover approximately 70% of the total value of mining production in the country, including gold, chromite, manganese, copper and iron. It excludes non-metallic minerals, for which quarterly data are not available. Annual data on non-metallic mineral production are, however, available; but no attempt has been made to date to incorporate them in the annual average index of mining production. There does not appear to be any reason why this should not in fact be done.

The quantity relatives for each of the component items are weighted by the value of production of each item in 1952. The index is thus a 1952-weighted Laspeyre index. The quantity relatives themselves are calculated, however, on the basis of the quantities produced in 1955.

The continued use of 1952 production values for weighting purposes is an anachronism that could be remedied with little difficulty. The available data suggest that the pattern of mineral production may have changed significantly since that date.

PRIVATE CONSTRUCTION STATISTICS

The Bureau of the Census and Statistics compiles and publishes four summary tables of private construction statistics -- two relating to the Manila district and two others (identical) detailing construction in 29 chartered cities and 4 municipalities. The tables contain monthly data on the number of building licenses issued and the permit value of such construction, broken down by type of construction (residential, industrial, institutional, alterations and repairs) and by type of building materials used ("strong", "mixed" and "light" materials).

The requisite data for compiling the statistics are taken from the monthly reports of the city engineers and building inspectors.

These statistics do not constitute reliable indicators of construction activity -- and this not only as regards construction in the country as a whole, but also as regards construction in the same cities and municipalities to which the statistics relate.

In the first place, no reliable estimate exists at all of the relative weight of construction in these cities and municipalities in total private construction in the Philippines as a whole.

Secondly, the data compiled on the number of building licenses issued are largely devoid of statistical significance for at least the following three reasons:

(a) A single license may be issued, for example, for the construction either of an individual house or a large block of apartments. There need thus be no close correlation between the trend implicit in the number of licenses issued and the actual volume of construction activity.

(b) Not a few of the licenses issued may not be exploited.

(c) Even if exploited, this may occur only after a very considerable time-lag.

Thirdly, no standard procedure is employed by the reporting cities and municipalities for estimating the permit value of construction. In some cases, "value" is taken as equal to that declared in the building license applications. Seeing that building license fees are generally levied in proportion to the value of the proposed construction, these declared values are presumably understated ocnsiderably. This presumption is strengthened by the fact that expenditure on private residential construction for own use may also be used for income tax assessment purposes. In other cases, (Manila, for example) the permit value of construction is apparently calculated by the city engineer's office by applying a standard scale of construction costs per square metre to the proposed area of construction. These cost scales are not always updated to take account of changes in building costs (as again, in the case of Manila).

A further defect of the series is that the monthly figures published are obtained as the simple aggregation of the reports actually in hand from the city engineers' offices for each particular month, at the time of compilation. In other words, if 20 reports were received for one month and only 15 for the following month, the monthly data published would be the unadjusted totals of the 20 and 15 reports respectively. The figures would thus indicate a decline in construction activity that was non-existent, and which merely reflected the fact that 5 municipalities had not sent in their licensing reports up to the time of compilation of the data. The usefulness of the series for current trend analysis is thus seriously impaired.

Much can and need be done to improve the present statistics for physical planning, national accounting and analytical purposes. The urgent need is for data on floor area and number of physical units (e.g. rooms, apartments, etc.) -- compiled separately for "new starts" and "completions". Failing this compilation should at least be made of the data on proposed floor area and number of rooms etc. included in the building license applications. Such data would reflect the trend of proposed construction which could perhaps be later adjusted to reflect actual construction, on the basis of correction coefficients ascertained from ad-hoc surveys.

At the same time, there would appear to be no good reason (other, perhaps, than budgets) why the reporting frame should not be extended to cover at least the approximately 500 first class towns and municipalities in which building licensing is said to be compulsory.

PHILIPPINE STATISTICAL SURVEY OF HOUSEHOLDS

The series of Household Surveys was initiated in 1956. The surveys are carried out twice yearly by the Bureau of the Census and Statistics and are mainly designed to provide information on the labour force, employment and unemployment. Other socio-economic data are collected on occasions, ad hoc.

For the most recent survey carried out, the sample comprised 6,500 households selected by the multi-stage method (barrios - 3,000; poblaciones - 1,500; Manila - 800; chartered cities and provincial capitals - 1,200).

The sample design employed is substantially the same as that set up for the 1956 Survey with the assistance of the Statistical Centre of the University of the Philippines and U. S. advisory experts. The sole modification, introduced some five years ago, is that a system of partial replacement of sample households is now employed. Under this system, one quarter of the households in the sample are replaced each year by new household chosen at random. In this way, the advantage of a comparatively fixed sample for measuring inter-period changes is coupled with a minimization of the bias likely to result from the repeated interviewing of the same households.

At the aggregative level and with the exception of the figures for unemployment, the estimating errors attributable to sample design and size do not appear to be excessive. For the April 1962 Survey the coefficients of variation calculated were as follows:

total population	1.75%
total number in labor force	2.42%
total number employed	1.78%
total number unemployed	11.39%
total number not in labour force	1.45%

While no coefficients of variation are available for the more detailed estimates derived from the Survey, it must be assumed that they are greater than those for the main aggregates.

Apart from the sampling errors, a considerable degree of response error may also be implicit in the information obtained from households. One possible source of error lies in the fact that one member only of the household is interviewed, and that this member gives information relating to all other members of the household. In many cases, the person found at home and interviewed is the housewife and not the actual breadwinner. The replies given to questions such as the degree of employment or unemployment of working members of the household during the survey week, or their economic branch and occupation, may thus be ill-informed.

However, the most important source of response error probably lies in the excessive turnover of interviewers from one survey to another. In many areas, including Manila, this turnover may exceed 50 per cent. There is thus no accumulation and improvement of interviewing experience and techniques at the lower levels, and interviewers have to be trained afresh for each survey.

A further serious effect of the lack of permanent interviewers is that the figures for total population derived from the Surveys are regarded as unreliable. The reason for this is that the count of the total number of households in each sample barrio and/or town precinct may vary from survey to survey, not because of actual changes in the number of such households, but because of imperfect enumeration. This, in turn, is largely to be attributed to the excessive turn-over of the interviewing staff. As a result, the fluctuations in the aggregate annual figures, obtained by inflating the sample results by the total number of households counted, may reflect not so much real population changes as imperfections of enumeration.

In order to overcome this problem, the figures initially obtained by inflating the sample results are subsequently "reconciled" with the independent estimates of population prepared annually as projections of Census or other bench-mark data, on the basis of known fertility and mortality rates, age and sex structure of the population, etc.

With a proper standard of enumeration, the estimates of total population obtained by inflating Survey data would provide an invaluable check on the projected estimates obtained globally. As it is, no such checking is possible and a major potential source of current information on population changes and trends remains unexploited.

In summary, it may be said that while the absolute figures obtained by direct inflation of the survey results are unreliable the relative weights of the main national aggregates obtained from the

Survey are probably sufficiently reliable, in most cases, for general analytical purposes. The main exception is the unemployment estimate which, with a coefficient of variation of over 11 percent, is incapable of measuring moderate fluctuations in unemployment rates.

At this juncture, two further weaknesses probably affecting the unemployment estimates should be mentioned:

(a) The survey periods are May - June and October - November of each year, the data collected relating to one week only. There are reasons for believing that these months are peak months for employment in agriculture, so that ceteris paribus the unemployment estimates obtained for this branch are minimal.

(b) The survey definition of unemployment excludes person unemployed but due to take up employment within 30 days of the date of interview. This again would tend to minimize the unemployment figures.

However, even assuming a considerably higher degree of reliability for the estimates, a figure for total unemployment only is of very limited value for most policy purposes. What are needed are reliable estimates of unemployment broken down by geographical area and economic branch and, perhaps, by broad categories of occupation. Both for reasons of sample size and response error, the present surveys are incapable of providing such information.

Policy making also requires estimates of unemployment at considerably greater frequency that is twice yearly, as provided by the present Surveys. Seeing that for budgetary reasons it is apparently impossible to increase the frequency of the Surveys in their present form, there would appear to be a strong case for restricting the detailed survey to once a year, and to think in terms of additional quarterly surveys devoted to gathering information on unemployment only. Such surveys would involve the asking of a very limited number of questions only, and their cost could be financed at least in part out of the funds saved from the detailed Survey.

Neither would the usefulness of the detailed labour force statistics be seriously impaired by restricting data collection to once a year only. With the exception of agriculture, seasonal influences are not apparently very pronounced in the Philippine economy. But in any case, seeing that two surveys have been carried out annually since 1956, it should be possible to derive information on seasonality that would be sufficient, for most purposes, for adjusting the results of a single annual survey.

FOREIGN TRADE STATISTICS

Until recently, foreign trade tabulations were prepared by three separate agencies: The Bureau of the Census and Statistics, the Central Bank and the Tariff Commission.

It has now been decided in principle that responsiblity for compiling these statistics will devolve entirely, in the future, on the Bureau of the Census and Statistics, which will incorporate in its punch cards the specific and additional requirements of the other two agencies.

The Tariff Commission has already wound up its independent operations in this field. The Central Bank, however, is continuing with the compilation of its own statistics pending updating of the Bureau of the Census' time-table. The preliminary figures of the Central Bank become available within two to three months after the end of the period to which they relate, whereas the Bureau of Census' figures appear at the present time with a time-lag of five to six months.

Merchandise Imports

In general, the import figures of the Bureau of the Census include all incoming goods passing through and cleared by the Customs Authorities. The source of data is the clearance orders issued by the Customs Authorities, authorizing release of the goods from the port area.

The Central Bank figures, on the other hand, exclude certain items such as raw materials used for work carried out in a consignment basis, rented equipment such as miner's lamps and cinematographic films, etc. The main source of information is similarly the clearance orders issued by the Customs Authorities. However, in the case of items such as crude oil imports, airplanes, ships, reparation goods and emergency rice importations, the requisite data are obtained directly from the agencies or firms concerned. These data are thought to be more accurate than those recorded in the clearance orders, and are also obtainable more quickly.

From the point of view of coverage, therefore, the data of both the Bureau of the Census and the Central Bank include all imported commodities other than:

(a) goods acquired from abroad by the security forces

(b) smuggled goods.

The smuggled goods are said to comprise mainly cigarettes, wines and spirits, watches, textiles and clothing. Their total value must amount to several hundred million pesos a year, so that the total value of imports compiled from the customs clearances must be understated to at least the same extent.

A further source of downward bias, also probably considerable, is the tendency on the part of importers to understate the value of goods imported and/or to misclassify them, so as to evade payment of ad-valorem customs taxes.

All in all, it appears likely that the understatement in the total value of merchandise imports in recent years arising from all causes has not been less than 10 per cent. [The preliminary estimate of the total value of imports in 1963 is ₱2,860 million]. It may even be considerably greater.

An important question from the point of view of measurement of economic performance is the degree to which the import figures compiled from customs clearance orders give an accurate picture of the real addition to resources in a given period.

Under the present customs arrangements in the Philippines, there is no necessary identity between the data on which a clearance order is issued (which is the basis for compiling the import statistics) and the date on which the goods are actually collected by the importer and enter the economy. Apart from extreme cases, the average time-lag is estimated by the Bureau of the Census at something less than one week. A time-lag of this order of magnitude probably does not seriously affect the reliability of the annual import figures, unless certain extremely weighty items such as ships or aircraft happened to have arrived around the end or beginning of the year. To a lesser extent, the same is also probably true of the quarterly figures. On the other hand, an average delay of roughly one week is sufficient seriously to impair the significance of the separate monthly data and their fluctuations, as measures of the real additions to resources in particular months.

The import data published by both the Bureau of the Census and the Central Bank are compiled on a f.o.b. basis. Seeing that the large bulk of the import values recorded in the customs manifests are c.i.f. values, this means that a great deal of time is taken up in converting from c.i.f. to f.o.b. values. This is undoubtedly one of the major factors contributing to the untimely delay in the compilation and publication of the import statistics. There would appear to be no good reason why the import figures should not be calculated c.i.f., as is the case in many other countries, particularly as in the Philippines the bulk of international freight and insurance costs in any case accrues to foreign firms.

Merchandise Exports

As in the case of imports, the export figures of the Bureau of the Census include all goods passing through and cleared by the Customs Authorities, while the Central Bank figures exclude certain items such as gold, embroidered fabrics the raw materials of which were imported on a consignment basis, etc.

The problem of smuggling also exists with regard to a number of export commodities, such as copra. The understatement of exports due to this cause is presumably much less, however, than in the case of imports.

As from the date of decontrol of foreign currency at the beginning of 1962, the declared value of exports contained in the customs manifests is thought to be reasonably accurate -- although there may be a certain amount of understatement in order to minimize the absolute amount of export earnings (20% of total earnings) that has to be surrendered at the rate of ₱2.00 per $1.00. Prior to decontrol, however, there may have been an incentive for exporters to over-state the value of their export earnings, owing to the fact that these earnings could be utilized for financing imports. Seeing that imports were subject to quantitative limitation, they realized in many cases high scarcity prices.

In the case of exports, compilation on the basis of the date of customs clearance would appear to give a good approximation to real flows.

FOREIGN TRADE INDEXES OF QUANTITY AND PRICE

The Central Bank compiles quantity and price indexes for both merchandise imports and exports.

The price index is a Paasche index and is calculated directly. The quantity index is derived as the quotient of the aggregate value index and the price index, and is therefore a Laspeyre type.

As in many other countries, the price is really a "unit value" index -- the average unit values of the various commodity items in the current and base years being obtained as the quotients of total value and the number of commodity units. The error implicit in this approach is probably not over-great, owing to the relative homogeniety of Philippine foreign trade, particularly exports.

From the point of view of coverage, the situation may also be regarded as satisfactory. The commodities used directly in the computation represented over 96% of import and export values in the base year (1955).

150

A major source of possible error exists in the fact that the indexes are calculated on a fixed (1955) base i.e. on the basis of the relative quantities and prices ruling in 1955. Seeing that the relative composition of both exports and imports must have changed considerably since 1955 -- particularly subsequent to the rescinding of foreign exchange controls at the beginning of 1962 -- the use of a constant 1955 base presumably results in a distortion of the indexes.

Nor will the problem be entirely solved by the fixing of a new base year. In a growing economy such as the Philippines, where the composition of foreign trade may be expected to continue to change in the future, the most feasible solution would probably be to calculate the indexes on a moving base i.e. by weighting the data for the current year by the relative prices or quantities of the immediately preceding year. This would mean a certain amount of extra work, but this would appear to be justified by the circumstances.

NATIONAL BALANCE OF PAYMENTS

The National Balance of Payments is complied by the Department of Economic Research of the Central Bank of the Philippines. It is drawn up largely in accordance with the scheme and definitions recommended by the International Monetary Fund.

Summary tables only of the annual balance of payments are published once a year in the Annual Report of the Central Bank, which appears in April - May each year. A semi-annual (January-June) estimate is also prepared, together with a breakdown of the annual figures by monetary region. These latter estimates are not published inside the Philippines, but are sent to the International Monetary Fund.

The data on merchandise imports and exports included in the balance of payments current account are the unadjusted foreign trade statistics prepared by the Central Bank. No attempt is made to correct for smuggling, understatement of values in customs manifests, time-lag between date of "clearance" and actual date of entry of the goods into the economy, etc. (See: "Foreign Trade Statistics").

A far more serious deficiency, however, is that the value of goods imported by the armed forces have been omitted in their entirety from the balance of payments current account. The value of such imports, which do not pass through the customs, is excluded by definition. from the value of merchandise imports compiled from customs manifests. In other countries similarly situated, the value of these imports is included, alternatively, in "Government n.e.s." or "Miscellaneous". This however, is not the case with the Philippine balance of payments, with the result that their value is entirely omitted. Ceteris paribus this omission probably accounts for a large part of the balance of payments balancing item "error and omissions".

The estimates for most of the services and capital items are based on the daily reports submitted by commercial banks to the Central Bank, detailing purchases and sales of foreign currency by purpose. As will become evident, the excessive reliance on these reports leads to a number of serious weaknesses in the estimates. In the first place, not all foreign currency transactions are effected via the commercial banks; and secondly, uncritical reliance on the classification made by the banks is in itself problematical. There is a need for greater effort to obtain data and information directly from primary sources, particularly from enterprises.

A further weakness implicit in the reliance on daily banking reports is that the estimates derived are on cash rather than on accrual basis i.e. the determining date is the date of the foreign exchange transaction and not the date on which payment is due. In most cases, however, this is probably not a serious limitation.

In general, the summary tables published in the Annual Report of the Central Bank are not sufficiently detailed for analytical and policy purposes. In particular, all data on capital transaction and donations are given net i.e. receipts less payments. However, publication of detailed breakdown of the main aggregates must be dependent in most cases upon a general raising of the level of reliability of the estimates.

Following is a brief summary of the principal deficiencies of the main items:

Foreign Travel

The expenditures of foreign visitors in the Philippines and of Philippine travellers abroad are estimated from data obtained from the daily reports of the commercial banks and the American Express.

Since the decontrol of foreign exchange transactions, it seems reasonable to assume that the large bulk of such transaction under this head passes through these institutions and is classified as foreign travel. However, foreign currency other than travellers' cheques exchanged directly by foreign visitors at hotels probably fails to be classified as such, so that the receipts estimates are to this extent biassed downwards.

During the periods of foreign exchange control, large dealings in foreign currency for foreign travel purposes were probably transacted other than through the regular channels. As a result, the

152

estimates of both receipts and expenditures for this period, based on the unadjusted reports of the banks, are presumably understated considerably.

Transportation

The estimates of cargo freight expenses are compiled from data recorded in the customs manifests, and are presumably firm.

The estimates for passenger transportation expenditure are based on data obtained from the daily reports of the commercial banks. They would therefore appear to be weak, seeing that a large part of this expenditure need not be reflected in the banks' report.

In many cases, purchases of tickets by Philippine residents from foreign air and shipping companies are presumably made in pesos, so that there is no need to purchase foreign currency for this purpose from commercial banks. Moreover, any peso balances ultimately converted by these companies into foreign currency would not represent gross passenger receipts but local operating surplus i.e. gross passenger and other receipts less local operating expenses. The sums converted would presumably be classified by the banks under "investment income" and not under "transportation".

Similarly, purchases of tickets by foreigners from Philippine international transportation companies are made, in many cases, abroad and foreign currency, They too would not be reflected, therefore, in the daily reports of the commercial banks.

Insurance

The estimates of merchandise insurance are based on customs manifests and are presumably firm.

The estimates of "other insurance" are compiled from the daily reports of the commercial banks and are probably weak. The reasons for this are similar to those mentioned with respect to passenger transportation. Premium payments of Philippine residents to foreign insurance companies are presumably made, in most cases, in pesos and thus do not involve the purchase of foreign currency via the commercial banks. At the same time, any peso balances converted into foreign currency by foreign insurance companies would represent transfers of operating surplus and not "sales" of insurance to Philippine residents. Such transfers would presumably be classified in the banks' reports under "investment income" and not under "insurance".

Investment Income

Interest payments to abroad on the public debt are obtained from the appropriate government agencies.

All other items under this head (i.e. profits, dividends, private interest payments, etc.) are estimated from the daily reports of the commercial banks.

Most foreign exchange transactions under this head presumably pass through the banking system, so that they are reflected in principle in the daily reports. However, seeing that the items concerned represent net taxable income, they are probably understated considerably. It appears likely that many such transfer of profits, dividends etc. are classified by customers under "miscellaneous" -- and this possibly with the connivance of the banks themselves.

Miscellaneous

The size of both the debit and credit items under this head appears inordinately large.

The debit amounts reflect in part the understatement of profits, dividends etc. transferred to abroad, as also (to a lesser extent, perhaps) of most other "invisibles". Part may also be attributed to the understatement of the value of imports by importers i.e. part of the currency purchased for financing imports would be declared to be for "miscellaneous " purposes.

On the credit side, perhaps half of the amounts recorded may be taken to represent purchases of goods and services by foreign from local enterprises. In principle, part would also reflect the understatement of factor income received by Philippine residents from abroad.

Official and Private Loans

The requisite data are obtained from the Foreign Loans and Investment Department of the Central Bank. However, not all foreign loans have apparently to be registered with the Department, so that the overall estimates are probably understated. The data are presented on a net basis only.

Other Official and Private Capital Movements

The main source of data is the daily reports of the commercial banks.

The extent to which these movements are covered by the bank reports is unclear. However, at least in the case of the acquisition of bonds and shares by foreigners in local enterprises (which is included here in principle) coverage must be limited, as acquisitions of this sort are not necessarily effected directly via the banking system or recorded as such in the banks' reports. These data too are presented on a net basis only.

CURRENT CASH POSITION OF CENTRAL GOVERNMENT

At the present time, the Philippine Government is unable to ascertain with the required degree of accuracy its current cash position at a particular point in time. The implications for monetary and fiscal management are very serious indeed.

The reasons underlying this situation are not connected with statistical methodology but derive from the accounting system and the methods of fiscal collection and fund disbursement employed. The possibility of improvement is thus conditional, primarily, on the introduction of the requisite changes in these fields. The main problems involved may be summarized under the following three heads:

Revenue in the "Pipe Line"

In many instances, government taxes are initially collected at the local level and subsequently pass through the heads of Municipal and Provincial Treasurers before finally being credited to National Treasury Account. This process may take several months, so that in the meantime the Treasury has no accurate knowledge of the funds actually at its disposal.

Warrants Outstanding Against the Treasury

No current record is maintained centrally of the value of warrants issued by agencies against Treasury account but which have not yet been presented by their recipients for payment. The only record maintained is of warrants actually paid. The Treasury thus has no current knowledge of the warrants outstanding against its accounts and which may be presented for payments at any time.

Balances of Government Agencies with Commercial Banks

In many cases, agencies withdraw their periodic budget allotments from the Treasury and re-deposit them with commercial banks. No current information exists at the central level regarding the value of the cheques issued by agencies against these deposits with commercial banks or of the outstanding balances.

The only information available centrally on a current basis (but with a time lag of several months) is in respect of the "obligations" entered into by agencies. This information is reported monthly by agencies to the General Auditing Office. No necessary identity exists, however; between these "obligations" and actual cash disbursements.

ON THE ACCURACY OF PHILIPPINE NATIONAL INCOME ACCOUNTS*

Gerardo P. Sicat

1. INTRODUCTION

The national income accounts are an important set of information regarding the ability of an economy and its sectors to produce goods in any given year. It has become fashionable to think of an economy's growth in terms of year-to-year changes in national income. In the Philippines, postwar growth of the economy is described with referrence to the growth of either the gross national product or the national income. This paper aims to examine the accuracy and the analytical uses of the national income data made available to the public.

Philippine national income data are available only for the postwar period.[1] The first task of compiling national income statistics for 1946 to 1951 was done by the Department of Economic Research of the Central Bank under the direction of William I. Abraham.[2] The work was carried on by the Central Bank until 1957 when the function was transferred to a branch of the National Economic Council. Lately, the NEC made a promise that an "extensive revision of the existing estimates for a period of at least the last ten years is programmed for 1963 to include all pertinent recommendations of the [National Economic Council] for improved, more reliable and more realistic figures."[3] Such results are to be awaited. This paper is confined to an assessment of the published estimates.

2. ESTIMATION PROCEDURES[4]

In the Appendix to this paper a brief sketch of the tabular and algebraic schema used in the estimation of Philippine national income accounts is made. The actual estimation procedure used by the builders of national income estimates will be outlined in this section. The qualitative value of the resulting estimates will be discussed in the succeeding section.

Philippine national income accounts are built essentially from estimates of national income at factor costs. The value-added originating from each sector is computed. All the sectoral value-added are then summed together. and the result is an estimate of national income at factor costs. The space available does not permit a detailed discussion of the estimation techniques for value-added originating in all the sectors. However it may be interesting to describe the procedures in brief here.

---

*Reproduced from The Philippine Review of Business and Economics, Vol. I, No. 2, October 1964.

156

There are seven broad categories into which the economy is classified for purposes of measuring national income by industrial origin -- agriculture, mining, manufacturing, construction, trade, transportation and communications, and services. Of course, each one of these broad categories is subdivided into as many sub-sectors as possible. For instance, in agriculture, the four-sub-sectors are agricultural crops, livestock and poultry, fishing and forestry; manufacturing is plit into sectors based, with minor modifications, on 2-digit classification along the lines of the International Standard Industrial Classification for manufacturing activities; and services into government, personal, professional, owner-occupied dwellings, and a catchall "other" services category.

The building up of national income estimates requires the use of various basic data from many sources. The sources of data for some sectors are oftentimes government agencies charged with administering certain functions that enable them to collect data useful for the national income. Some such agencies are the Bureau of Mines, Bureau of Forestry, the General Auditing Office, Bureau of Public Works, the Sugar Quota Administration. Certain government institutions charged with the collection of primary data have of course been important sources of data.[5] The Central Bank, the Agricultural Economics Divisions of the Department of Agriculture and Natural Resources, the Bureau of the Census and Statistics periodically gather data on different types of industrial undertakings.

The techniques used in estimating value-added originating in a sector would depend largely on the availability of direct data, of surveys, and the degree to which reliance on benchmarks and imputations are made. Value-added estimations often start with a computation of total value of production. Here a great deal of imputations and extrapolations are made not only as a modus operandi in national income estimation but also because basic data are either often lacking or in bad shape. With the value of production known, the next task is to compute value-added in that sector (which is equivalent to the sector's total value of production minus purchases from other sectors). But instead of estimating in detail the amount of materials purchased from other sectors, total value of production is multiplied by fixed ratios (of value added to total value of production) to obtain value-added estimates. The ratios employed are mostly those derived and used by Abraham in compiling the first national income estimates. The basic questions having to bear on the results is the accuracy of the assumptions, the benchmarks, the ratios, and the indexes used in making the sectoral estimates. The value-added originating in a sector is often a composite of these techniques depending on the number of subsectors into which that sector is divided and the availability of data in each of them. A short description of these procedures can unduly extend the discussion, but the interested reader is referred to the relevant methological papers and the critical work regarding them.[6]

After national income at factor costs is known, the next task is to split this aggregate into the shares of the factors. Two items are presumed to be known before all the other shares are found -- private corporate income and the property income of government. Private corporate income (which is referred to in the accounts as "other private income") is a measure of the undistributed profits of private corporations and of the taxes they paid during the year. However, these estimates consist only of straight line projections of taxable net income and tax assessments, not really estimates based on actual corporate accounts. To measure undistributed profits an allocation ratio of 74 per cent is used on net corporate income (i.e., after taxes are paid); the remainder are assumed as distributed profits. Taxes paid by corporations are not really taxes paid but only tax assessments on corporations.

The property income of government consists of the net profits (i.e., after administrative, operating, and other expenses are subtracted from gross profits) of about 25 corporations either owned or controlled by the government. The losses of government corporations are listed as subsidies.

Private (non-corporate) income is now made rather easy to get as soon as the two previous items are known. To arrive at it, private and government corporate incomes are deducted from the national income at factor costs. This residual (which was 95.8 per cent of national income in 1961 and 85.4 per cent in 1962!) is then split between wage income or "compensation of employees" (44 per cent of total), and non-wage income, or "entrepreneurial and property income of persons" (56 per cent of total). These allocation ratios were used by Abraham when he compiled the first national income estimates for the Philippines. The factor shares originating in agriculture are derived by splitting the value-added in agriculture in the ratio 28-72 per cent between (1) wage and (2) non-wage earners, respectively. The residual of these factor shares are assumed to be the shares of wage and non-wage earners in the non-agricultural sectors.

At this point it would be interesting to mention the method used in the derivation of private disposable income, which is considered the main variable determining private consumption expenditures in the theory of national income determination. Personal direct taxes, which are estimated from the fiscal accounts, corporate income of government and undistributed private corporate income are deducted from national income at factor costs. When transfer payments and net donations from abroad are added to the difference, private disposable income is derived.

The accounts are now built up to produce the gross national product and its expenditure components -- private (i.e., personal) consumption expenditures, government expenditures, gross domestic investment and net foreign investments. Gross national product is arrived at by adding the estimates of depreciation and indirect taxes-less-subsidies to national income at factor costs. Depreciation on durables are based on current replacement costs, using a straightline depreciation method on the assumption that durables have a life of 10 years. While government equipment is depreciated along the same line, no depreciation allowance is given to government construction. For private construction a fixed depreciation allowance of ₱230 million has been in use ever since the national income accounts were constructed! Indirect taxes are taken from the fiscal accounts and are the sum of all taxes not levied on corporate or personal income.

Except for private consumption expenditures, all the expenditure components are estimated somewhat more directly. Government expenditures are derived from the fiscal accounts while net foreign investment from the balance of payments. Gross domestic investment is estimated by the following method. All goods with an expected durability of two years are allocated either as consumer or capital goods, according to ratios determined by the Central Bank. The capital goods allocation ratio varies from 10 per cent to 100 per cent depending on the type of the equipment. A mark-up of 50 per cent of the c.i.f. cost of imported goods and 25 per cent of the factory price of domestically produced durables are used for adjusting for market valuations. Changes in agricultural and livestock inventories are estimated by the Department of Agriculture and Natural Resources and the Sugar Quota Administration. The non-agricultural inventories are computed by the application of fixed percentages of gross sales or production.

The construction component of gross domestic investment includes private as well as government construction. The permit values for private construction in Manila and other areas are derived from the Bureau of the Census and Statistics. It is assumed that the private construction in Manila is 30 per cent of total private construction and that farm construction is fixed yearly at ₱10 million. The Bureau of Public Highways, the Bureau of Public Works and the General Auditing Office provide data for government construction.

Deducting government expenditures, gross domestic investment and net foreign investment from the gross national product leads to an estimate of private consumption expenditures. It should be pointed out that private consumption expenditures comprise a big share of gross national product, around 85 per cent. It is therefore somewhat strange, and in the case of the share of private non-corporate income in the national income of factor costs, that no attempt has been made to measure this component at least by a more direct method.

The discussion of the estimation procedures for some components of national income in the Philippines was made only for a few specific aggregates. It is impossible to discuss the estimation procedures without getting into details not intended here.

3. ACCURACY AND ANALYTICAL USES

Although the description of the procedure of national income estimation is sketchy and touched only on major items, questions cannot be avoided about the level of precision of the accounts, and consequently, about the analytical uses that may be made of the income aggregates.

The accuracy of the income accounts would depend on the nature of the estimation procedures and the size of the errors resulting. If the errors arising are random, then they would tend to cancel each other out, when all estimated items are added together to form larger aggregates. But this can be true only when these items have fairly equivalent weights relative to each other, which is not the case. But allowance may be made for this. Even in countries with the most advanced statistical systems, items in the national income accounts have varying levels of accuracy.

An early study made by Simon Kuznets,[8] one of the foremost authorities on national income, showed that items comprising about 29.6 per cent of US national income had margins of errors of 5 to 10 per cent, 40.4 per cent margins of errors of 11 to 20 per cent. The remaining components had larger margins of errors. However, when balanced by certain omissions in income estimation and when the errors offset each other in the total aggregate, Kuznets suggested that the average margin of error of US accounts is 10 per cent.[9]

If the margins of error for a country with a highly developed statistical system can be that high, then the Philippines which has a relatively much poorer statistical system may be expected to have larger margins of errors. It is not possible to make detailed sector by sector studies about the deviation of reported estimates in the national income accounts and re-estimated values for these items as Kuznets and his colleagues had done. In fact it is not the aim of this paper to make even any re-estimation. But evidence on the matter for at least a few estimates of some national income estimates is available, and it will be cited when the occasion arises.

Broadly, two types of errors may be outlined for the estimates of Philippine national accounts. The first category of errors are those that result from adding up all the estimates of items that lead to the major aggregates -- income originating in major sectors, national income at factor costs, and the largest aggregate, gross national product. Since all sectoral estimates are to be estimated first and all these estimates are summed up, any errors resulting from each estimation procedure have effects on each of the major aggregates mentioned.

The second category of errors arises from the breaking down of the major aggregates built from the estimates of national income at factor costs and of gross national product. In determining the value of certain aggregates, it often turns out that "allocation" ratios are used to distinguish one item from another. The amount of direct measurements of the item is minimal since large aggregates are split up into minor aggregates by just multiplying them by allocation ratios derived from the 1948 Census.[10] Moreover, it is not uncommon to find that where there are more than two large aggregates forming a "super" aggregate, the method used is to estimate the smaller items and then derive the value of the larger items by computing them as "residuals". Thus, suppose that there are errors arising from per sector and subsector estimation procedures. Assuming further that allocation ratios used have wide error margins. Therefore, it is not unreasonable to expect all residual measures to be widely off from their correct values. So far as the national accounts are concerned, no estimation attempts have been made of these large residual items since the first accounts have been put up.

The above errors can make the national income aggregates in any given year yield measurements with wide margins of errors. Hence, it may also be expected that changes are also subject to errors.

In the remaining discussion, certain items will be discussed by putting them in an analytical framework and examining the results later. Two analytical items that may be introduced from the national income series will illustrate the state of affairs of at least the accuracy of absolute levels and the year to year changes of national income aggregates. The first of these two items is the (simple) consumption function and the second the incremental capital-output ratio (ICOR). Both of these topics are of importance in discussions of economic development. The consumption function can say something about a country's capacity to save, since what is not spent on consumption is presumably saved. The value of the ICOR enables economists to say something about the productivity of investment in terms of additional national income created. Therefore, in some respects the ICOR can also give hints as to the year to year changes in the increments to the economy's capital stock (investment) and to the economy's national income or output.

The series for personal consumption expenditure and for private disposable income will be studied first. The data will be limited to the years 1946 to 1960. In national income theory, it is assumed that private consumption expenditure is dependent on the level of personal disposable income. Taking this simple relationships, it is possible to estimate a consumption function.

The simplest consumption function is the linear form. Private consumption, C, in year t is a linear function of private disposable income, Y, in that year, except for a random error, u. Therefore this requires the estimation of two constants ("parameters") a and b from the equation

$$C_t = a + bY_t + u_t.$$

The data on C and Y will lead to estimates of these constants when traditional statistical techniques of estimation are used.[11]

Since national income accounts are reported both in current prices and in constant[12] prices, estimates of the parameters are made from both sets of data. The following table shows the results of the calculation. The estimate of a and b for both sets of data are shown together with the correlation coefficient r and the simple consumption-income ratio, c/y. The derived consumption functions for both types of data fit very well as the very high estimates for r show.

Table 1
ESTIMATES OF CONSUMPTION FUNCTION

	a	b	r	c/y
"Current"	-465.4	1.069	0.99	1.004
"Constant"	-554.2	1.094	0.99	1.011

However, a quick reflection on the nature of the estimates reveals that they contradict empirically tested notions about the consumption function. (Picture the traditional graph for the consumption function with consumption on the vertical axis and disposable income on the horizontal axis and the so-called 45-degree line.) It is generally held that the intercept, a, is non-negative, more often positive in value and that b is less than 1. At zero income, a person or country cannot save. The negative value of a exactly means that it can. Moreover, values of the estimates for b, which is equivalent to what is known as the "marginal propensity to consume," are not in keeping with the stability properties of any economic sector. The data that generated the estimates of b and c/y are for 14 years. It is highly doubtful that for such a period the household sector has been spending more than its additional income, in other words "dissaving". But this is exactly what a greater than 1 value of b and of c/y mean.

These results are difficult to accept considering that domestic generation of savings has been evident by the increase in the savings and time deposits of the commercial banking system and by the continuous survival of partnerships and individual proprietorships as business organizations.

The items on gross capital formation (or gross domestic investment) and changes in national income will now be examined by some attempts to measure the gross incremental capital-output ratio[13] for the Philippine economy. The ICOR is an important concept in models of economic growth. The Harrod-Domar model of growth has it as a major parameter that shows how much income growth can be expected from aggregate investment expenditures.[14]

The ICOR series is built on the assumption that it takes on the average at least one year for investment expenditures to yield increases in income. Therefore, the ICOR is equivalent to gross capital formation in year t divided by the change in gross national product from t to t ≠ 1. Again computations for ICORs based on current and on constant prices are made.

Two estimates of the ICOR are made for each of the data using "current" and "constant" prices. The first one is a simple ICOR based on the yearly series of capital formation and gross national product and the second type is based on 4-year centered moving averages of gross capital investment and change in gross national product. The unreliability of the estimate is reflected by the high year-to-year fluctuations in the ICOR values. However, they show that computations of the ICOR based on the 4-year centered moving average removed all these fluctuations and stabilizes the nature of data.

Table 2 shows the estimates mentioned. For 1949-58 the moving average computations were based on data from 1946 to 1961. As would be expected, the simple ICOR is less reliable as an estimate of a parameter since it changes so often that it looks like a variable. Therefore, in view of the fact that the ICOR should eliminate fluctuations in income aggregates, the moving average computations are more reliable. "Reliable" here would be a relative matter. The average ICOR on the basis of current prices for the period under consideration is 1.51 and for constant prices 1.31. These estimates appear to be very low considering the a priori belief of most writers in economic development that the value of the ICOR is between 3.0 and 4.0.[15] Of course, much of the discussion about the ICOR is rather vague considering that it is not known whether the ICORs referred to are "gross" or "net".[16]

Table 2
GROSS ICORs

	1949	1950	1951	1952	1953	1954	1955	1956	1957	19
Current										
Simple	24.00	1.36	0.77	3.69	1.14	3.88	1.40	1.10	1.49	1.
Centered	1.52	1.88	1.52	1.38	1.68	1.62	1.49	1.44	1.30	1.
Constant										
Simple	1.93	1.39	2.00	0.80	0.74	1.36	1.09	1.14	2.43	4.
Centered	0.84	1.44	1.27	1.13	1.05	1.04	1.22	1.56	1.83	2.

In the ECAFE countries, the values of the ICOR are reported to be between 2.02 to 3.07.[17] However, the computed ICORs for the Philippines shown in Table 2 are lower. It is good for a country to have a low ICOR because this implies that it can get more additional output for less investment. But the question of data accuracy immediately comes in considering that even early writers have said that the ICOR in the Philippines between 1950-54 was 0.67 and 1.2 for 1950-59.[18] It may be said at this point that the values of the net ICORs are much lower than the gross ICORs reported in Table 2.[19]

Moreover, the data of other countries have yielded estimates of the ICOR much higher than the ones revealed for the Philippines by the national income data.[20] If the data are beyond suspicion, then it is easy to believe that the ICOR for the Philippines is really way below the usual expectations.

Such state of affairs in the national income accounts gives an inaccurate picture of the economy. How it can mislead economists is seen by the way even as distinguished an economist as P. N. Rosenstein-Rodan interpreted Philippine national income data. In an otherwise very important paper[21] Rosenstein-Rodan said in a footnote[22] that the Philippines has

> "a very low savings rate of 7-1/2 per cent which, moreover, may still be a slight overestimate. [The] Investment and Savings rates could and should be raised considerably by a more vigorous development policy."[23]

Thus, in two analytical examples, the national income data do not yield logically acceptable results. The conputations of the ICOR and of the consumption function seem to suggest that the estimates of gross capital information, gross national product as well as other items do not reflect highly reliable results. Therefore, it is possible to begin with a hypothesis that the national income accounts do not yield relatively correct orders of relative magnitudes either in the totals or in the year to year changes.

A number of studies give corroborative evidence for these hypothesis.

Recent studies have shown the high margins of errors of several national income aggregates. They cast doubts on the estimated values of private consumption expenditures and saving and on domestic capital formation.

In March 1957 were published the results of a survey of family income and expenditures conducted by the National Economic Council and the Bureau of the Census and Statistics.[24] The PSSH study, as this is popularly known, reveals that the household has been on the whole doing substantial positive saving. The PSSH data have been used in the estimation of a consumption function for the Philippines.[25] The marginal and average propensities to consume were found to be 0.76 and 0.88, respectively. Although the PSSH data probably reveal more correctly the proper consumption-income ratios for the household sector, the absolute values of income and expenditures are somewhat underestimated.[26]

The pioneering work of Richard W. Hooley on saving in the Philippines[27] provides the most significant evidence on the inaccuracies of the national income accounts regarding saving and consumption expenditure.

Hooley compiled data on saving bringing together two sets of independent estimates. The first is based on changes in the net assets of households. The second is a direct estimate of household consumption using as much of the PSSH, foreign trade, and domestic production data in the estimation of consumption expenditure. Saving was computed as a residual from personal disposable income. Both methods did not yield identical estimates for household saving, but they show conclusively that the household sector has been generating substantial savings. Hooley estimates that the household has accounted for more than half of the saving generated yearly from 1951 to 1960, whereas the national income accounts report that only the government and corporate sectors have been performing the function. From the time series he constructed, Hooley made an estimate of a linear consumption function based on per capita saving and personal disposable income. It turned out that the marginal propensity to save is equal to 0.22 (which implies a marginal propensity to consume of 0.78). This is rather close to the estimate based on the PSSH data.

It has been pointed out that private consumption is estimated as a residual of gross national product, after deducting estimates of government expenditure, gross domestic investment, and net foreign investment.

Hence any errors in the estimates of the three mentioned components of gross national product will naturally affect the value of the residual.

To take the nature of the estimates for only gross capital formation is enough to establish the point. If gross capital formation is underestimated, then personal consumption expenditure is overestimated provided that gross national product is a fairly correct estimate. The fact that gross capital formation estimates appear to be in error is an example of errors of the first kind for this particular sector.[29] Assume, however, that errors of the first kind are absent for gross national product estimates. The following will show whether or not such assumption is valid.

Certain studies give conclusive evidence on the underestimation of capital formation in the Philippines. Papers by R. F. Trinidad,[30] D. C. Cole,[31] and R. W. Hooley[32] have made this point.

Trinidad re-estimated the magnitude of gross domestic investment for the years 1956 and 1957, taking into account the suggestions of a United Nations group[33] regarding the underestimation of capital formation in underdeveloped countries. This was done, first, by increasing the coverage of estimation and, second, by adjusting capital goods prices due to undervaluation. Increased coverage was attempted to take account of (a) indigenously produced capital goods, (b) land development, (c) military construction for civilian purposes, (d) building construction activities not reported to the civil authorities, and (e) inventory changes in agriculture, government, corporation, and other industries. Trinidad's reestimation procedure is along the commodity-flow method, which is used in the Philippines.

He tried to overcome the difficulties of undervaluation by employing mark-up ratios derived from a survey of marketing mark-ups for capital goods -- a mark-up of 103 per cent instead of 50 per cent on imported durables and 94 per cent instead of 25 per cent on indigenous capital goods.

From Trinidad's estimates, it can be shown that the undervaluation of durables in 1956 and 1957 was by as much as 51.4 per cent. The underestimation of gross domestic investment for the two years was around 35 per cent. And yet, it is Trinidad's belief that in spite of the significant adjustments he made, the level of investment in the Philippines is still not fully estimated and that a wider and better coverage can still be made possible.

Cole, on the other hand, tried to point out from a study of the financial structure of manufacturing that capital formation in manufacturing appeared to be underestimated. He did not point out the exact magnitudes of this underestimation.

Hooley criticized the commodity-flow method of estimating capital formation. By using the expenditure method in the examination of the income statements of mining firms, he was able to produce evidence on the underestimated levels of capital formation in mining as reported in the accounts.

One way of taking in this information on underestimation is by adjusting capital formation estimates upward. This would lead to new figures of consumption, a residual estimate. Suppose that on the whole gross domestic investment was underestimated by approximately 35 per cent.[34] Gross domestic investment is jacked up by a constant adjustment rate.

Table 3 shows the results of such adjustments on estimates of the "parameters" of the consumption function and the gross ICOR computed from the national income accounts.

With the adjustment of the aggregates on consumption, the estimated constants of the consumption function now become altered, but a comparison with Table 1 shows that such alteration is only very slight.

Table 3
ADJUSTED CONSUMPTION FUNCTION AND ADJUSTED ICORs

	a	b	r	c/y	Average Gross ICOR (1949 - 58)
Current	-449.8	1.034	0.99	0.96	2.06
Constant	-563.8	1.051	0.99	0.97	1.77

The marginal propensity to consume, b, is still above 1.0 in terms of both current and constant price measures. But the consumption-income ratio is slightly less than 1.0, meaning that the household sector on the average saves but only very little. Considering the evidence already cited, even this measure seems to be inaccurate. The ICOR values appear to be reasonably altered. However even these values are low when compared with the usual conjectures about the value of the ICOR. If the measure of ICOR is to be net rather than gross, the computed values after readjustment would be even less. In the literature, the confusion on ICOR values is due to the fact that it is often not known which is meant, the gross or the net.

If the above evidence obtained in computing some parameters which are of analytical value to the economist are to be taken seriously, then it is not correct to assume that errors of the first kind do not exist even for the aggregate measures of gross national product. It is also foolhardy to assume the other way around: that all errors are of the first kind and no errors of the second kind -- those due to breaking down national income into different magnitudes not directly estimated. A mixture of errors is certainly responsible for the inaccuracies of the national income data. Unfortunately, it is almost impossible to tell which category of errors abound in greater degree.

4. GENERAL SUGGESTIONS FOR IMPROVED ESTIMATES

In this paper, some evidence regarding the unreliability of national income aggregates were presented. Defects in resulting statistics are due to the estimation procedures used. A sketch of these procedures was given in the second section. In view of the resulting crudeness in the national income data, there is even no need to touch on the finer points of controversies regarding national income estimation.

Some general comments regarding the improvements of the estimates will be made in the space that remains.

On a general plane, it may be said that there is a serious need to improve the sectoral measures. Precision in the sectoral accounts will improve the estimates of the national income aggregates. This will minimize the errors resulting from "adding up" sector accounts and those from "breaking down" large aggregates into sub-components.

The problem of utilizing better raw data and better statistical "parameters" -- e.g., allocation ratios -- arises. In this no other aid can be more useful than increasing the amount of meaningful statistical studies and maximizing information derived from existing studies and data so that the sector estimates of income will have sounder statistical bases. This is indeed a very general comment. Since the mid-1950's a lot of statistical surveys have bloomed mostly under the direction of the Office of Statistical Coordination and Standards of the National Economic Council and of the Bureau of the Census and Statistics. Moreover, the year 1960 was a nationwide census year. These surveys and, more specifically, the census are going to be very important foundations for better national income estimates, if optimum use is made of them.

Some statistical surveys have been used in improving the estimates of national income. But there are important and specific cases in which little or no use has been made of the findings of the surveys.[37] It appears that except for Hooley's direct estimates of consumption with the help of the PSSH survey on expenditure and income, no attempt has been made to utilize the PSSH data for national income purposes. Instead, the National Economic Council continues to estimate consumption using the residual method. Moreover, the mark-up ratios used by Trinidad in revising investment estimates are not used. Instead the same unrealistic mark-ups are utilized so that little adjustment for undervaluation of capital is done. These are serious shortcomings in the national income estimates that can be improved. Yet, the latest accounts do not appear to have incorporated these important findings.

Much depends on statistical policy if the national income accounts are to be improved. Serious attempts should be made by the precision of the national income statistics by improving existing estimates and by increasing the coverage of the statistics. Perhaps, greater insistence on better national income estimates will have bigger pay-off than building altogether different statistical data -- such as input-output table. There is however the possibility that an attempt to build such a table might help to improve the income accounts. Even then, although there will always be some "region of ignorance regarding sector or aggregative income accounts, putting emphasis on decreasing the size of this "region" would be much better than building other statistical measures in which some "region of ignorance" is just as large (if not larger) as that for national income estimates.

As a final remark, economists and users of income data should feel indebted to William I. Abraham in 1952 for building out a mass of unrelated statistics the first Philippine national accounts, to the Central Bank of the Philippines and, later, the National Economic Council for both continuing the work. It appears however that the performance of the statistical agencies in the succeeding years at least with respect to the improvement of the basic accounts is still wanting.

NOTES

---

[1] Although attempts to estimate 1938 national income have been made by Marvin E. Goodstein, The Pace and Pattern of Philippine Economic Growth: 1938, 1948, and 1956, Data Paper No. 48, Southeast Asia Program, Department of Asian Studies, Cornell University, 1962.

---

[2] National Income of the Philippines and Its Distribution, New York, U.N., 1952.

[3] "Technical Notes to the National Income Accounts for 1959-1961," Statistical Reporter, April 1963, p. 22.

[4] The main material from which this section is drawn are the "Technical Notes to National Income Accounts of the Philippines," The Statistical Reporter, April 1962 (pp. 22-30); April 1963 ("Supplementary Technical Notes," pp. 22-23). See also Ruben F. Trinidad, An Inquiry into the Sources and Methods of National Income Accounting in the Philippines, unpublished master's thesis, University of the Philippines, 1958.

---

[5] However, other sources of important data that have not been tapped fully, at least for the estimates made prior to 1963, are the Social Security System and the Government Service Insurance System, two agencies that have yielded important data on aggregate business and professional income, wages, and the like in the course of their work.

[6] See Statistical Reporter, op. cit., Trinidad, op. cit,; Clarence L. Barber, Report on National Income Estimates in the Philippines, Statistical Center, University of the Philippines, June 1960, mimeo.; Kenneth W. Masters, "Statistical Sources Used in National Income Estimates in the Philippines," Statistical Reporter, vol. 2, no. 2, April-June 1963, pp. 24-8; and Emmanuel Levy, Review of Economic Statistics in the Philippines Interim Report, World Bank Resident Mission, Manila, May 1964. The works of Barber and Levy are particularly detailed examinations of overall national income estimation methods in the Philippines and contain concrete suggestions for improvements.

---

[7] The National Income of the Philippines and Its Distribution, op. cit.

---

[8] See Simon Kuznets, National Income and Its Composition, National Bureau of Economic Research, 1942, vol. 2, ch. 12; a discussion of this is found in Oskar Morgenstern. On the Accuracy of Economic Observations,

Princeton, New Jersey, Princeton University Press, 1963, pp. 254-259.

[9] Kuznets, op. cit., Morgenstern, op. cit., p. 255.

---

[10] As a student unaware of the manner of estimating national income, I once tried to measure the share of wages in the national income at factor costs. To my surprise, I discovered that from 1946 to 1960, the share of wages remained almost unchanged and was always well below 50 per cent. Such results will be understood more if the procedures of income estimation were really known. Indeed it was a very foolish exercise knowing afterwards how the allocation ratios were applied on the aggregates that split income between wages and non-wages.

---

[11] In this case, the least-squares method was employed.

[12] The disposable income series was computed from the income accounts, since this is not available in final form. Disposable income was deflated using the deflators for gross national product, since no deflators for disposable income are available. The data compiled took account of the suggestions in the Technical Notes to the National Income Accounts regarding the updating of the yearly data.

[13] In a still unpublished and longer study by the author, the net ICORS were also computed, but for illustration, the gross ICORS are the only ones shown in this paper.

---

[14] Just as well known is the inverse of the ICOR, which is often called the "capital coefficient" in discussion of growth and development.

---

[15] Among those who share this view is W. Arthur Lewis; see his Theory of Economic Growth, London, 1956.

[16] "Gross" and "net" here imply the presence or deleting of depreciation in the magnitudes used.

---

[17] See United Nation ECAFE Survey of 1961, p. 96.

---

[18] Ibid.

[19] These results are contained in a yet unpublished paper.

[20] Benjamin Higgins, Economic Development Principles, Problems, and Policies, New York, W.W. Norton, 1959, p. 649.

---

[21] "Foreign Aid to Underdeveloped Countries," Review of Economics and Statistics, vol. 50, May 1961.

---

[22] Ibid., 131.

[23] In another footnote (ibid., 136), Rosenstein-Rodan said the following: "Some studies suggest that the present rate may not be more than 7 per cent in which case higher amounts of [foreign] aid [are] required to secure a 3 ½ per cent rate of growth ... It is ... a matter of policy judgment whether such a negative incentive [meaning, increased foreign aid] to an insufficient development effort should be given ..." Bracketed words inserted by the present author.

---

[24] Philippine Statistical Survey of Households Bulletin, March 1957, Series No. 4 "Family Income and Expenditures."

[25] In an unpublished work by the author.

[26] For a very interesting review of the PSSH study, see Clarence L. Barber, "The Philippine Statistical Survey of Household (PSSH) Bulletin on Family Income and Expenditure: A Critical Appraisal," Statistical Center, University of the Philippines (no date, mimeo.).

---

[27] Saving in the Philippines 1951-1960, Institute of Economic Development and Research, University of the Philippines, 1963.

---

[28] See above, pp. 9-10.

[29] See above, p. 12.

---

[30] "Some Proposed Improvements in the Estimates of Capital Formation in the Philippines," Statistical Reporter, vol. 4, April 1960, pp. 28-40

[31] "Growth and Financing of Manufacturing in the Philippines" Institute of Economic Development and Research, University of the Philippines, 1963.

[32] "A Critique of Capital Formation Estimates in Asia with Special Reference to the Philippines," Philippine Economic Journal, forthcoming and "Savings and Capital Formation in Mining; 1951-1959," Institute of Economic Development and Research (mimeo., 1961).

[33] Report of the Second Working Group of Experts on Capital Formation, Bangkok, United Nations Economic and Social Council, 1960 (E/N. II/ASTAT. Conf. 3/L.2).

---

[34] Note that the assumption that errors of the first kind are absent from the gross national product estimates.

---

[35] From an unpublished study of the author.

---

[36] Such as those covered in A Critique of the United States Income and Product Accounts, Studies in Income and Wealth, vol. 22, National Bureau of Economic Research and Princeton University Press, 1958.

---

[37] Saving in the Philippines, op. cit.

DISTRIBUTION OF GROSS DOMESTIC INVESTMENT BY TYPE OF CAPITAL GOODS, INDUSTRIAL USE, AND PURCHASERS

By Ruben F. Trinidad[*] and Leticia L. Santos[**]

The presentation of gross domestic investment by type of capital goods, industrial use, and purchasers represents an expansion of the national income statistics of the Philippines. It was undertaken to fill a basic need of several economic research and planning agencies of the government. The importance of the study on these aspects of investment has long been recognized by economists, for it is the process of capital formation that has largely dictated the strides made by the country towards economic development. It is believed that this body of statistics will serve as a basic tool in the structural analyses of the investing sectors. Besides, a statistical series on investment would be an important indicator of the success of any investment program. It is for these reasons that all these years there have been urgent demands for statistical data on investment that would reflect types of capital goods, the industries using these capital goods, and the respective shares of the public and private sectors in this stock of producers goods.

In response to these needs, the gross domestic investment data for the years 1956 and 1957 as originally incorporated in the National Accounts of the Philippines were re-studied and re-distributed as shown in the table.

---

[*] Statistician III, National Income Branch, Office of Statistical Coordination and Standards, National Economic Council.

[**] Statistical Aide II, National Income Branch, OSCAS, NEC.

Conceptual Basis Underlying the Estimate

Gross domestic investment, otherwise referred to as gross capital formation, is that part of the nation's current output and import of capital goods that is added to the demestic stock of capital. It represents the expenditures by the producing units of the economy on fixed durable equipment and the changes in their inventories. In principle, all durable equipment with a life expectancy of over one year are classified as fixed investment. In practice, however, durable goods of relatively small value and subject to frequent replacement are considered as current consumption goods even though their expected life may exceed the durability criterion. When durable equipment are measured without allowance of depreciation, obsolescence and accidental damage, the aggregate capital formed is referred to as "gross domestic investment". If, however, the said provisions are deducted from gross domestic investment, what remains is referred to as "net domestic investment". The latter represents the net addition to the country's capital stock available for future production.[1]

Fixed durable equipment includes the value of the purchases and own-account construction of fixed assets by enterprises, private non-profit institutions serving business, and general government. Also included are expenditures for irrigation and flood control projects, land reclamation and improvement, developmental costs of orchards, plantation and forest, residential and non-residential constructions, general government expenditures for civil defense, public works, major repair and maintenance work, where they extend the life and productivity of the assets and the transfer costs involved in the acquisition of used assets and land.[2]

---

[1] Concepts and Definitions of Capital Formation. Studies in Methods, Series F. No. 8 (New York: United Nations, 1953) p. 7.

Excluded in the measure of capital formation are government capital expenditures for military defense purposes, general government outlay for machinery and equipment that cannot be ascertained, and newly discovered natural resources. Also excluded are current expenditures for social overheads such as research, health, and education. Although it is of great advantage to obtain data on these items, their inclusion in the estimate of capital formation would present insurmountable difficulties.[3]

The valuation of fixed capital investment includes only expenditures directly related to their production or acquisition. These consist of the purchase price, taxes, freight, installation charges, professional fees and other similar outlays. In the case of own-account construction, particularly those in the farms, the value of capital formed is limited to the cost of materials used and the payment of hired labor. With respect to construction activities that extend beyond the account period, only the change in the value of work in progress is included in the estimate.

Changes in inventories represent the value of the physical change in raw materials, work in progress, and finished goods which are held by the enterprises. Included are changes in farm stocks such as grains and livestock, stocks of goods in the possession of marketing authorities, and the stock of strategic materials in the government stockpiles. Since

---

2/ Methods of National Income Estimation. Studies in Methods, Series F. No. 8 (New York: United Nations, 1955), pp. 30-31.
3/ Concepts and Definitions of Capital Formation, pp. 8-9.

the source of data are the accounting records of the enterprises concerned, valuation is in terms of book values. It is, therefore, necessary to eliminate the effects of price changes to achieve a measure of the value of physical change. This is done by valuing the difference of the stocks at the beginning and at the end of the year by common prices.[4]

DISTRIBUTION OF GROSS DOMESTIC INVESTMENT
IN THE PHILIPPINES, 1956-1957

(Million Pesos)

By Major Categories and Types of Capital Goods	1956	1957
Construction	405.8	453.3
1. Dwellings	148.2	165.3
2. Non-residential buildings	64.5	86.1
3. Other construction and works (Public Works)	193.1	201.9
Durable	341.7	406.0
4. Transport equipment	84.3	92.0
5. Machinery and other equipment	257.4	314.0
Change in Inventories	112.5	125.1
GROSS DOMESTIC INVESTMENT (All capital goods and/or all major categories)	860.0	984.4
By Industrial Use and Major Categories		
Fixed Investment	747.5	859.3
Agriculture	57.6	62.7
Mining and Quarrying	36.5	32.5
Manufacturing	148.5	187.1
Transportation	42.1	47.2
Communication and Utilities	34.5	51.4
Construction	352.3	388.7
Ownership of dwellings	141.2	158.3
Government (Public Works)	193.1	201.9
Construction enterprises	18.0	28.5
Trade	43.8	47.5
Services	32.2	42.2

---

[4] *Methods of National Income Estimation*, p.35.

DISTRIBUTION OF GROSS DOMESTIC INVESTMENT IN THE PHILIPPINES, 1956-1957 (cont.)

By Industrial Use and Major Categories (cont.)

	1956	1957
Change in Inventories	112.5	125.1
Livestock	113.6	102.5
Sugar	-19.5	0.5
Mining	7.5	10.4
Manufacturing	14.8	15.6
Trade	-3.9	-3.9
GROSS DOMESTIC INVESTMENT	860.0	984.4

By Type of Purchasers

	1956	1957
Government	193.1	201.9
1. Public Enterprises	13.3	13.9
2. General Government	179.8	188.0
Private	666.9	782.5
3. Private enterprises	554.4	657.4
4. Change in inventories	112.5	125.1
TOTAL	860.0	984.4

Coverage of the Estimates of the Philippines

The Philippines estimate of gross domestic investment is basically in accordance with the concepts and definitions recommended by the United Nations. Statistical limitations, however, did not permit a full coverage of some items of investment which should have been included.

The items included in fixed capital formation are dwellings, non-residential buildings, public construction, transport equipment, and machinery and other equipment. The change in inventories included livestock, sugar, mining, manufacturing, and trade.

Dwellings consist of new residential structures, including major alterations and repairs to buildings. Data on value of residential and non-residential construction are compiled by the Bureau of the Census and Statistics directly from the City Engineers' Office (for Manila) and from reports of five suburban towns around Manila and twenty-seven cities.

Non-residential buildings represent commercial, industrial and utilities, and institutional buildings.

General government construction and works are expenditures on public works (buildings, roads, highways, portwork) land reclamation and improvement, irrigation and flood control, and other similar expenditures. Data are obtained from the annual reports of the Bureaus of Public Works and Highways, and the General Auditing Office. Construction expenditures of government corporations consist of buildings and major repairs and maintenance of their fixed assets. Data are obtained from the annual reports of government corporations.

Durable equipment consists of machinery, agricultural implements, electric appliances, vehicles and miscellaneous metal manufactures. Durability criterion of equipment in the Philippines was fixed at two years. Data are obtained from the import and production statistics of the Central Bank. About 94 percent of durable equipment that enter into capital formation is imported and only about 6 percent is of local origin. The locally produced durable goods consist mostly of rice mills and hullers, vehicles assembled locally and truck or bus bodies.

The aggregate estimate of fixed capital formation is understated by the amount of the value of agricultural developmental cost of farms, orchards, forests, and the transfer costs involved in the purchase of used assets and land.

Inventories that contribute to capital formation are limited to agricultural, mining, manufacturing, and trading industries. It is also doubtful whether the coverage represented in the estimate is complete.

Agricultural inventories are limited to livestock and poultry. These data are obtained from the annual crop and livestock survey of the Agricultural Economics Division, DANR. Grain inventories, whether held in the farm or in the government stockpile are not accounted for.

Manufacturing inventories consist of raw material, goods in process of manufactures, and finished goods, as reflected in the books of manufacturing firms.

Mining inventory consist of the stocks of minerals, stores of commodities and current capital assets in the companies. Trade inventory represents the stock of goods for sale at the end of every accounting period. The basic data are obtained from the Department of Economic Research of the Central Bank. Sugar in stock, as reported by the Sugar Quota Office, is also included.

Methodology

Gross domestic investment was distributed according to three standard classifications, namely: by type of capital goods, by industrial use, and by type of purchasers.

Distribution by type of capital goods classified the gross domestic investment into dwellings, non-residential buildings, other constructions and works, transport equipment, machinery and other equipment, and change in inventories.

Data on capital goods were first identified from the general list of imported commodities. The amount of imported capital goods that form part of capital formation was determined by applying to each item an appropriate "coverage ratio" ranging from 10 to 100 percent as previously determined by the Central Bank. A uniform 50 percent mark-up was added to all imported durables to bring them to market prices. The amount of locally produced durable goods that form part of capital formation was determined by deducting from the gross value of production, the cost of imported intermediate products. A uniform 25 percent mark-up was added to the factory prices of the produced durables to allow for the marketing costs. Allowances for exports of durables were also considered in determining the total fixed durables that went into capital formation.

With regards to the estimation of private investments on dwellings and non-residential construction works, the estimates were based on building permit valuation for Manila. To arrive at total expenditures for the country a 30:70 ratio (for Manila and the rest of the Philippines, respectively) was used. This was based on a survey of construction distribution in the Philippines conducted by the Central Bank in 1949. In addition, a ₱10 million allowance for own-account constructions by farmers were also added. Capital formed out of government public works activities was obtained directly from the reports of government agencies. Calendar year estimates were computed by taking the averages of two fiscal years.

Data on change in non-farm inventories were obtained from the Gross Sales Section of the Department of Economic Research, Central Bank. The aggregate inventories shown, covered 3,438 cooperating firms engaged in mining, manufacturing, and trade. The value of change in inventories did not represent replacement costs, since these data were simply the difference of two book value entries in the business accounting books. Included in the estimate of change in inventories are carabaos, cattle, horses, goats, sheep, hogs, chickens, ducks, geese, and turkeys. Sugar inventory was obtained in the form it is desired.

The classification system used in the industrial distribution of gross domestic investment corresponds closely to the major divisions of the International Standard Industrial Classification of all Economic Activities. Capital goods were classified in the group where these were put to actual use. Consequently, producers' durable, vehicles, constructions are classified with the industry where the establishment undertaking the capital outlay belongs. Since ownership of dwellings and government constructions do not fall in any industry group as provided by the ISIC, it was necessary to designate a new "industrial" group to cover these items. For this reason, "government" was set up as an industrial group to represent capital formation undertaken by the government in public works, and "ownership of dwellings" to represent investment in residential construction.

Producers' durables were distributed among the various industrial groups, in the following manner. A comprehensive list of producers' machinery and equipment was prepared from the import and production lists of the Central Bank. Machinery and equipment that could be identified as being used in any of the industrial groups were immediately segregated and distributed among the appropriate industries to which they belong. The remaining unallocated machinery and equipment were grouped into categories that may be distributed among any two or three industries. Capital-expenditure ratios for the two or more industries just mentioned were derived by inferring from the pattern of investments of these industries in 1948 (Economic Census of 1948). These ratios were applied to the corresponding aggregate value of machinery and equipment to arrive at the desired distribution of these equipment to the industry they pertain.

Construction data are presently divided into residential and non-residential types. Residential construction was assigned to the industry "ownership of dwelling". In non-residential construction, the portion falling under trade, services, and manufacturing and utilities were also identified. The aggregate falling under the construction industry represented only durable equipment used by the industry in undertaking construction works for other industrial groups. Own-account constructions of farmers were assigned to the agricultural industry.

Transport equipment were broken down into those used in the transportation industry and those used by other industries (except those that were considered used by the personal and general government sectors). The transport equipment used by industries, other than the transportation industry, were prorated among agriculture, mining and quarrying, manufacturing, communication and utilities, construction enterprises, trade, and service industries.

Distribution by type of purchaser was classified in gross investment according to the sector making the capital outlay, such as government or private enterprise.

The foregoing estimates of gross domestic investment according to type of capital goods, industrial use, and purchaser should be improved further. While the estimate of capital formed in durable equipment is deemed adequate enough, the contribution of construction and the distribution pattern of transport equipment require improvement. It is hoped that with the results of the various statistical projects being undertaken by the OSCAS, a more reliable and complete estimate of capital formation can be made.

Reproduced from The Statistical Reporter, Vol. IV, No. 2 (April 1960), pp. 28-40, published by the Office of Statistical Coordination and Standards of the National Economic Council.

SOME PROPOSED IMPROVEMENTS IN THE ESTIMATE OF CAPITAL FORMATION IN THE PHILIPPINES

by

RUBEN F. TRINIDAD*

The gross domestic investment is among the aggregates of the national income and product estimates of the Philippines that has stirred no little interest as well as criticisms. The general users of these data expect to establish behavior equations that adequately describe the role of investment in the increase of the nation's output and in the addition of employment opportunities that contribute to the present economic situation. The economic planners attempt to establish ratios and trends which, when related to relevant totals, could be very useful for the planning of economic development. The theoreticians and students of economics hope to use these data to derive such parameters as the incremental capital output ratio, rate of savings, marginal efficiency of capital, etc., in connection with their exercises in the finer aspects of economic analysis. However, due to the latent inadequacy of the estimates of capital formation and perhaps other related totals, the equations, ratios, trends, and parameters that may be derived will present distorted pictures of the past and present economic situations.

Most users of the national income statistics have invariably attributed these wrong presentations of economic facts to the serious understatement of the gross domestic investment. The claim is not without foundation. In fact, the weaknesses that pervade the estimates of the

---

*Senior Statistical Coordinator, National Income Branch, Office of Statistical Coordination and Standards, National Economic Council.

The writer wishes to express his grateful appreciation to Mrs. Nelia R. Marquez and Mr. Danilo B. Zapata for their invaluable computational aid in the preparation of this paper.

national accounts of the Philippines are also the same shortcomings found in those of other countries of similar statistical development. It is also noted that these pitfalls are found even in countries with more advanced statistical systems. These limitations of the estimates are not due to ignorance nor the faults of past and present estimators. Rather, the institutional conditions and statistical inadequacies were the factors responsible for these shortcomings.

It was the general consciousness of the inadequacies of statistics that present efforts are not spared to bring forth more and reliable statistical information. In this general effort, foreign experts are engaged to help plan the statistical development and improvement in the country. Filipino technicians are sent abroad to learn new statistical techniques. Their active participation in international conferences and in working groups are fostered for the purpose of sharing experiences and learning from the common problems presented by technicians of different countries. All these efforts have resulted in the improvement and additions to the body of economic statistics in the Philippines. These developments make it imperative to evaluate and improve the national income statistics in this country to make it more responsive to the requirements of its users. There is a wide latitude for improvement that could be undertaken, but it would be physically impossible to dwell on them at one time. This paper, therefore, will be limited to the discussion on the improvement of capital formation statistics.

The object of this discussion is to bring to the fore the shortcomings of capital formation estimates in the Philippines in the light of the suggestions and recommendations of the United Nations and of the working group of experts on capital formation statistics which was convened at Bangkok, Thailand from November 11 to 27, 1959 in which the writer participated. A review of the concepts and methods of estimating capital formation as recommended by the United Nations is here presented. This will serve as standard to which the common procedures followed in many underdeveloped countries will be compared. Using as basis the findings of the working group on capital formation, attempts will be made to improve upon the sources and methods of estimating gross domestic investment in the Philippines. Statistical information obtained through recent surveys conducted under the auspices of the Office of Statistical Coordination and Standards and various government administrative statistics not used before, were availed of in the estimates presented in this work.

CONCEPTS AND METHODS

A general survey

The term "investment" is normally construed to include all types of physical and financial assets. In the context of national income, however, investment refers solely to physical assets. It represents the portion of the nation's output and imports of durable goods that are added to the domestic stock of capital goods of the economy. When investment is measured as total capital flow within a specified accounting period, it is referred to as "gross domestic investment" or "gross capital formation" of that period. When measured as a net addition to the stock of capital goods for the economy, it is referred to as "net domestic investment" or "net capital formation". Net capital formation is derived by deducting the provisions for depreciation, obsolescence and accidental damage to capital from the estimate of gross domestic investment. Within the purview of these definitions, only expenditures on fixed durables, work in progress, and net changes in the stocks of working capital of the producing units are included.

Excluded in the measure of capital formation are the purely financial assets and the so-called "social development" expenditures for the development of the human resources. Although their contributions to production cannot be overestimated, yet they are excluded conventionally from the estimate of capital formation, since their measurements present formidable problems. For instance, the cost of educational and health facilities provided to the individuals are excluded, even though their benefits are realized in the form of increased production, because human beings are not considered as capital goods.[1] Also excluded are expenditures of business which are expected to contribute to future production, e.g., advertising, research, etc., since there are no clearcut relationships between these expenditures and their roles in increasing productivity.[2] There are also others, though considered capital in the field of accountancy, e.g., patents, copyrights, concessions, leaseholds, and goodwill, which are excluded owing to difficulty of assigning realistic values on them.

---

[1] A System of National Accounts and Supporting Tables (Draft Revision for Comment), Studies in Methods, Series F. No. 2 (New York: United Nations, 1959), p. 9

[2] Concepts and Definitions of Capital Formation, Studies in Methods, Series F. No. 3 (New York: United Nations, 1953), p. 8.

Investment in fixed durables is referred to as "gross fixed investments" . It consists of the values of machinery, equipment, and constructions and works purchased by the enterprises, private non-profit institutions serving business, and the general government. Also included as fixed investments are the values of the changes (in work in progress) in construction works. In valuing fixed capital formation, only the expenditures directly related to their production or acquisition are included. These consist of the cost of manufactures, taxes and trade margin. Trade margin includes the costs of transportation, delivery, installation and the preliminary outlay connected with capital formation such as site clearance, fees to architects and engineers and all legal fees and cost of construction. Indirect costs are treated as current outlays.[3] Durable goods, except construction works undertaken by the household are excluded from fixed capital formation. These items are, by convention, considered current consumption expenditures on account of difficulties involved in their measurement.

Investment in the form of changes in inventories consists of stock changes of purchased materials, work in progress, and finished products held by the producing units or held as part of the stockpile of the general government. Also included are changes in farm stocks such as grain and livestock. Stocks held by the household or of the government, except the stockpiles mentioned earlier, are also regarded as current consumption expenditures. Excluded also are increases in natural resources due to growth or discoveries.

Gross additions to the nation's stock of durables are valued at market price, i.e., the purchase price, in order to make their valuations consistent with the prices at which the other components of the gross national product are appropriated. The changes in inventories are valued in terms of their replacement costs, in order to eliminate the consequent capital gains or losses due to changing levels of prices.

Methods of estimation

The two basic approaches in the measurement of capital formation are the "commodity approach" and the "expenditure approach".[4] In the former case, capital formation is measured as the sum of domestic production and importation of durable goods less those, other than dwellings, sold to households or exported. The measurement by commodity flow method requires several levels of adjustments. It is necessary to adjust production data by the changes in inventories held by the producers or distributors, in order to estimate the flow of capital goods accruing to a definite accounting period. Since capital formation is valued at cost to the final users, it is also necessary to estimate the mark-up of the import or ex-factory prices of the durable goods. Finally, it is equally important to establish knowledge of the usual disposition of the produced or imported capital goods between capital formation, consumption, and for repair and maintenance.

---

[3] A System of National Accounts and Supporting Tables op.cit., p. 29.

[4] Concepts and Definitions of Capital Formation, op.cit., pp. 9-10.

In the expenditure approach, the measurement of capital formation is made from the expense accounts of the producers. Data obtained are expenditures for machinery, equipment, buildings, and other construction works. Available data on capital expenditures already include the purchase prices of the fixed assets and such other expenses incurred in their acquisition, such as taxes, transportation, installation, and trade margins.

The application of these two methods in any country depends largely on the statistical resources available. In many instances, both methods are employed in the estimation. Usually the commodity flow method is used in the estimate of capital formation in the form of durable equipment, while the expenditure approach is used in the estimate of capital formation in the form of public or private construction. [5]

Some conceptual and statistical difficulties

The general weakness of capital formation statistics in the underdeveloped countries is attributable to the undervaluation, undercoverage and duplication of its components. These are brought about by the prevalence of non-monetary activities and the unavailability of adequate statistics. On account of these limitations, many of the statements of definitions, coverage, and methods, which appear simple conceptually, become unwieldy when these are translated in the forms of statistics.

One of the causes for the serious undercoverage lies in the interpretation of the "criterion of durability". As a general rule, the United

---

[5] Report of the Second Working Group of Experts on Capital Formation, E/Cn. 11/ASTAT/Conf. 3/1.2,

Nations suggests that all durable producer goods with an expected lifetime of more than a year and are not entirely written off in the accounts in the year they are purchased, should be included as capital goods.[6] By this criterion, it is implicitly suggested that expenditures on small items such as hand tools, motor tires, office equipment, and other minor equipment, irrespective of their lifetime, be excluded from capital formation expenditures, on the ground that expenditures of these types are recurrent and require constant replacements. While this is acceptable in the more industrialized countries where productive activities are generally undertaken in the factory, caution should be taken in applying this criterion in the predominantly agricultural countries where most of the productive activities are done in the households. In most small-scale productive activities in an agricultural economy -- handicraft, seasonal carpentry work, etc. -- hand tools are almost entirely the only capital equipment involved. To omit these items from the estimate of capital formation in this type of economy would give a distorted presentation of economic situations.

The treatment of expenditures on repair and maintenance of durables also present problems of coverage. The solution suggested by the United Nations is to include as part of capital formation those expenditures on repair and maintenance that more than just keep the capital goods in a state of constant repair. This means the inclusion of the costs of major repairs and alterations done on capital goods only. This distinction is vague and ambiguous. For instance, it is not possible to differentiate major from minor repairs and maintenance in buildings. Hence, most countries have included in toto repair and maintenance expenditures in their estimates of capital formation. In the case of machinery and equipment, parts usually cannot be analyzed from the production and trade statistics to determine their allocation between maintenance, repair and assembly. In such cases, the working group suggested that imported or locally produced parts for repair and maintenance may be split between consumers' durables and capital items in the same proportion as the finished products are distributed.[7]

Many items of finished durable goods which are used for capital formation and also for consumption present difficulty of allocation.

---

[6] A System of National Accounts and Supporting Tables, op. cit., p. 29.

[7] Report of the Second Working Group of Experts on Capital Formation. E/CN. II/ASTAT. Conf. 3/L.2 (Bangkok, Thailand: United Nations Economic and Social Council, 1960,) pp. 16, 35.

Examples of this type of goods are automobiles, refrigerators and air-conditioners. There are instances when finished machinery and equipment, such as power-generating machines, radio, air-conditioners, telephone, etc., become part of the cost of building construction. This difficulty arises when the commodity flow approach is used in the estimate of investment in durables. The working group feels that experts may help split the mixed items between consumption and capital formation. Ratios for splitting mixed items may also be derived from data in some regulatory or statistical offices. For instance, transportation equipment may be split into consumer's goods or capital goods by means of information on vehicle registrations.[8]

The widespread existence of many small-scale businesses in the underdeveloped countries gives rise to the general undercoverage of indigenously produced durables. It is the consensus that these small-scale industries produce quite substantially equipment, tools and vehicles. The usual practice is to omit these capital goods entirely. The working group suggested that surveys on capital formation in agriculture may be taken periodically or that some few basic questions may be included in censuses and surveys that would elicit information on capital formation in the non-monetized sector of the economy. Some ideas of totals on capital formation may be deduced also from employment data and occupational distribution in the population census.[9]

In most countries of the underdeveloped areas, the estimates of the value of private construction are also subject to serious undercoverage. Their undue reliance on records of permit valuation or on compiled data on construction materials are the usual causes of the undercoverage. Generally, building permits on construction are required in urban areas only, hence, the reported value of construction represented only a small portion of the total value for the entire country. Considering the predominantly rural nature of most underdeveloped countries, a sizeable portion of construction activities is left out. Besides, the permit values usually differ from the true values of the buildings upon completion. There are also varying time lag between the issuance of permit and the start of construction work. At times no construction may even be undertaken as shown in the permits issued.

Estimates of the value of construction through technical ratios of materials to other costs of construction, are also fraught with serious limitations. Generally, it is not easy to build up the list of construction materials from import and production statistics, not to mention the problem of allocating them as to use in construction, repair and maintenance, or for purposes other than construction. Besides, the relationship between materials and the other costs, especially labor cost, is subject to radical fluctuations over short periods of time or between geographic locations. It is also usual that many types of rural construction materials, such as bamboo, nipa, or mud are not easily determinable, but are used quite substantially in the countries of the underdeveloped regions.

---

[8] Ibid., p. 15.

[9] Ibid., p. 21.

Conceptually, it seems easy to estimate government capital formation since the government keeps account of all its expenditures. But estimators meet considerable difficulties when they analyze the government accounts for expenditures on items of capital formation. In most cases, items of expenditure in the government budgets and accounts are not described clearly. Such being the case, analysis cannot be made on the basis of technical knowledge or general judgment. There is also the problem of double counting with respect to durable equipment. It is not usually possible to allocate machinery and equipment appearing in the production and import trade statistics between the public and the private users thereof. The problem of double counting occurs when machinery becomes part of construction. Problems such as these require information from sources outside the budget or accounts of the auditing office. The working group on capital formation felt that there should be developed in the various agencies of the government, uniform and detailed accounts which are consistent with economic concepts. The biases of time lag and pre-payments are also found in the government capital formation.

Perhaps one of the most undercovered sectors of capital formation is the cost of land development. As a matter of fact, many countries exclude this item entirely for lack of data. Especially in an agricultural economy, expenditures are substantial for the expansion of perennial crop plantations, planting and replanting of forests, expansion of fish-ponds, etc. In the context of capital formation, these activities contribute to capital formation.

Valuation problem constitutes the second principal cause of underestimation of capital formation in the underdeveloped regions. Valuation difficulties are inherent in almost all components of gross domestic investment. These problems are, however, especially emphasized in the non-monetized activities of the rural economies.

In the monetized components of capital formation, the problem of bringing up items to their market prices are usually formidable especially where compilation starts from the production and trade lists. Prices of these durable items are usually expressed in their import and ex-factory prices. Since items of capital formation are to be measured in market prices, it is necessary to adjust these prices to cover mark-ups due to taxes, transport costs, installation costs, and trade margins. A census of distribution would provide the best solution to the problem of mark-ups.[10] However, a survey of mark-ups for items that compose investments would be a desirable alternative. One way of estimating the mark-up is to make inquiries on sales and import or ex-factory prices from typical distributors. It is expected that sales prices should differ in various parts of the country due to transport costs variation. In addition, it would be desirable to determine the channels through which items of investment are procured by their users. This would enable the estimators to adjust the mark-up ratios of items that are imported directly by the users.

The real problem of valuation is formidable in the non-monetized sector of the economy. Capital formation in these areas usually take the form of land reclamation and improvements, digging or deepening of canals and wells, building farmhouses, cattle sheds, and manufacture of minor equipment and vehicles. Valuation at money costs of these items are unrealistic, since a great part of the value of capital goods are contributed by unpaid labor and materials. The working group of capital formation suggested the valuation of these assets at real costs incurred, e.g., inclusive of the values of unpaid labor put in at prevalent rates in the neighborhood and imputed values of all materials used.[11]

The estimates of stock changes also suffer underestimation due to serious undercoverage and undervaluation. In most countries of the underdeveloped region, capital formation in the form of stocks are limited to livestock and a few agricultural crops. A few countries that report stock changes in the non-agricultural industries cover but partially the changes in inventory on account of difficulty of basic data on which to base the estimate. Double counting is also a characteristic of the estimates in changes in inventory. This weakness is particularly true with capital formation estimated by the commodity flow method. This method presupposes that all durable equipment obtained from the production and import trade statistics are purchased and consequently used by the business sector. Stock changes, therefore, reported for the trade and manufacturing sectors undoubtedly count for the second time the durable equipment reported in the item "fixed capital formation." In addition, owing to the absence of appropriate price data for deflation purposes, stock changes are usually reported as book value changes, hence the failure of the estimate to allow for capital gains or losses. Some rough estimates of changes in inventories might be achieved by applying inventory-sales or production ratio to total sales or production. This procedure has been resorted to even in the more developed countries. Kuznets used this method in his estimates of inventory changes in the United States for the years 1919-1933.[12]

---

[10] Ibid., pp. 18-19.

[11] Ibid., p. 41.

Practices in the underdeveloped countries

Countries in the underdeveloped areas making estimates of capital formation follow more or less the same procedures. Variations in their approaches are dictated largely by available statistics particularly on production and expenditure for capital goods.

In the estimate of durable equipment, reliance is made mostly on foreign trade and production statistics. There are also a few countries that make use of expenditure data. Some countries extract only a few broad groups and consider these figures as a measure of total durable equipment. Other countries analyze their import and production statistics in sufficient details, but hardly split mixed items realistically. Generally, parts are not at all analyzed to exclude those used for repair. To bring the values of durables to market prices, most countries apply arbitrary mark-ups over the import and ex-factory prices. These mark-ups are usually rough and outdated. Burma adds a straight 67 per cent over total import values of durable equipment and construction materials. Ceylon makes separate estimate of distribution cost and trade margins and allows an additional 30 per cent for the costs of installation. In Pakistan, taxes are added to cost, insurance and freight values before adding 25 per cent to allow for trade and transportation mark-up. Only indigenous production of large-scale producers are included in the estimate of capital formation. Due to very little data on production of machinery and equipment in the non-monetized rural areas, not even approximate production is reflected in the estimate of capital formation. China, Japan and the Federation of Malaya measure durable equipment by expenditure approach. Data are obtained through survey of capital-expenditures and from the financial statements submitted by the enterprises to tax authorities.[13]

---

[12] James P. Daly "A Review of Existing Estimates of Business Investment in Inventories," Problems of Capital Formation. Studies in Income and Wealth, Vol. 19 (Princeton: Princeton University Press, 1957), pp. 57-89.

Basically, there are two approaches followed in the estimate of capital formation in construction. One method, -- "the expenditures method" -- is based on compiled data from building permits. Another method -- "the commodity flow" -- is based on data compiled from construction materials statistics. China, Japan and Thailand hinge their estimates on building permits. In China, building permits cover about 85 per cent of construction in urban areas, over which a straight 10 per cent is added to cover for undervaluation of permit declaration. Japan makes estimate from the data on commencement of building construction. Small-size dwellings with areas of less than 10 square meters each are not included in the estimate. An-additional allowance of 30 per cent is made for undervaluation. In Pan-Malaya, the estimate of building construction is based on annual returns by architects. The Federation of Malaya makes use of data from the survey on the start and completion of construction of residential and non-residential buildings. The estimate of Thailand is also based on building permits. Since the requirement of permit is limited to urban areas, rural constructions are usually not accounted for in the estimate of these countries. A few countries follow the "material approach." Burma applies 67 per cent over the import and ex-factory values of construction materials to estimate value of construction. Ceylon estimates construction to be 10/3 times the value of imported building materials. In India, data on utilization of materials such as iron and steel, cement and bricks have been used along with technological ratios between costs of materials and total costs of consttruction. Estimates are considered very rough, because of the heterogeneity of construction costs in different parts of India. Pakistan tried to work out estimates based on technological ratio between labor costs and total construction cost, but later had to give way to the material cost approach. The "labor approach" consisted of estimating annual payroll in construction. Payroll was inflated by 40 per cent to estimate total construction. The value arrived at by this approach was considerably higher than the aggregate derived by the material approach, so it was discarded in favor of thelatter on the ground that underestimating is always to be preferred to overestimation. In South Vietnam, 60 per cent is added to available construction is added to available construction materials to arrive at the total construction value.[14]

---

[13] Report of the Second Working Group of Experts on Capital Formation, *op. cit.*, p. 17-19, 21, 44.

With respect to changes in inventories, only China and Japan appear to have the most complete estimates. Data are obtained from sample survey of enterprises. Japan reports book value changes, while China undertakes inventory valuation adjustments using the wholesale price indexes as deflators. Other countries have only very fragmentary estimates of changes in inventory.

Early estimates in the Philippines

The first estimate of gross domestic investment in the Philippines was undertaken by the Central Bank in 1952 under the guidance of William I. Abraham. It was classified by types of capital goods and by types of purchasers. The distribution by types of capital goods had classified investment into dwellings, non-residential dwellings, other construction and works, machinery, transport equipment, and changes in inventories. The classification by types of purchasers divided investment between the private sector and the government sector. Investments in the public sector were directly estimated. The difference between gross domestic investment and public investment was allocated to the private sector. In 1956, the Office of Statistical Coordination and Standards expanded the classification by distributing gross domestic investment by industrial use.[15]

A closer look into the estimates of capital formation in the Philippines would reveal the same basic causes of underestimation that underlie the estimates of countries in the ECAFE region. Foremost is the prevalent undercoverage in most items of capital goods -- indigenously produced capital goods; land development; investments in perennial crops and fishponds; planting, replanting and reforestations; military construction for civilian purposes; building construction in the non-permit areas; and stock changes in agriculture, government corporations and other industries. Another source of underestimation stems from undervaluation of new capital formed. Undue reliance on outdated mark-up ratios and on permit valuations are the main sources of this undervaluation.

---

[14] Ibid., pp. 23-25.

[15] For a detailed discussion of sources and methods, refer to R. F. Trinidad and Leticia Santos, "Distribution of Gross Domestic Investment by Type of Capital Goods, Industrial Use and Purchaser," The Statistical Reporter, Volume II, No. 3, pp. 14-18.

PROPOSED MEASUREMENT OF CAPITAL FORMATION IN THE PHILIPPINES

The estimates presented below were undertaken in conformity with the suggestions and recommendations of the United Nations and in the light of the discussions held last year by the working group of capital formation statisticians. The basic statistical sources, methodology and limitations of the present estimates of capital formation were dealt with as the discussion progressed. Improvements over the previous estimates were also pointed out to bring into focus the main sources of the improved estimates.

Table 1 shows the gross domestic investment classified according to the types of capital goods. Investments in the form of durable equipment and changes in inventories for crops were measured by the commodity flow approach, while private and public construction and change in inventories, except for crops, were estimated by expenditures approach.

Durable equipment. - Durable equipment consists of imported and locally produced agricultural and industrial machinery, transport equipment, and miscellaneous instruments and tools. These make up about 41 per cent of total gross domestic investment. The estimates were built from the comprehensive list of durables prepared originally by the Central Bank. This list was reviewed and updated against recent import and production statistics. The coverage ratios ranging from 10 to 100 per cent that were used to allocate durable goods between capital formation and consumption were analyzed with the help of experts. Imported parts, such as those for automobiles, air conditioners, transformers, etc. were dropped from the list. However, the assembly of the same parts by local manufacturers were included in their entirety. Motor vehicles were allocated between capital formation and consumption on the basis of motor vehicle licenses issued on them. Data on indigenous production of capital goods were based on the results of the surveys on manufactures conducted annually since 1956.[16] Indigenous production is the value shipment -- adjusted to the changes in inventories. These surveys covered only establishments employing five or more workers. Hence, the equipment made by establishments employing less than five workers and those produced by the users on their own account were omitted in the estimate.

---

[16] 1956 Annual Survey of Manufactures, Vol. I, Series 2 (Manila: National Economic Council-Bureau of the Census and Statistics, 1958), pp. 111-112, 141.

TABLE 1. Gross Domestic Investment
[Million Pesos]

	1956	1957
Gross Domestic Investment	1,241.0	1,422.7
Gross Fixed Investment	1,133.7	1 339.7
Durable equipment	507.7	624.6
Machinery	409.2	447.5
Transport	98.5	177.1
Construction	626.0	715.1
Private	357.2	435.0
Residential	234.2	321.4
Non-residential	123.0	113.6
Public	232.1	231.7
Residential	1.5	1.2
Public Works	190.5	204.1
Enterprises	40.1	26.4
Land development	36.7	48.4
Perenial crops	30.8	43.1
Forestry	4.5	4.5
Fishing	1.4	0.8
Changes in inventory	107.3	83.0
Private	81.2	54.1
Government enterprises	26.1	28.9

The straight mark-up used to bring the c.i.f. and ex-factory prices of imported and indigenous durables to their respective market prices were also examined. A mailed questionnaire survey was conducted on February 3, 1960 to determine the levels of valuations of typical durable equipment -- f.o.b. (free on board), cost, insurance, freight (c.i.f.), and the selling prices. The questionnaires were sent to representative distributors in Manila only. The distributors were also asked their expert opinion on the relative proportions of the machinery and equipment imported directly by the end-users to machinery and equipment procured from the local trade channels.

The preliminary results of the survey had interesting revelations. (See Table 2.) The mark-up rate for imported durables was placed at an average of 103 per cent (20 per cent for tax mark-up and 83 per cent for trade margin) compared to the straight 50 per cent used in previous estimates. In the absence of data on mark-up for the indigenous durables, the trade margins for the various categories of imported durables were used, except those for automobiles which were estimated separately. The overall mark-up for indigenous durables was 94 per cent compared to 25 per cent used in the previous estimates. The tax mark-up was disregarded since most local manufacturers enjoy tax exemptions. Indigenous durable goods make up about 15 per cent of gross domestic investment. In most cases, the reported market prices already reflected the transportation and installation costs. The preliminary results also show that about 90 per cent of the machinery and equipment of the producers were purchased through the local trade channels.

Construction. The value of construction accounts for about 50 per cent of the annual gross domestic investment. It consists of government expenditures on public works, private residential and non-residential buildings, and land development expenditures in the form of plantations, forest lands, and fishpond development.

The aggregate value of residential construction was derived from the survey of the number and value of houses built in 1956 and 1957. This estimate was based on a multi-stage sample of 6,500 households scattered over 300 barrios, 150 poblaciones and 58 provincial capitals and cities, and Metropolitan Manila.[17] The value of private non-residential construction except for manufacturing, was based on the permit valuation reports of Manila, 28 cities and five suburban towns

---

[17] The Philippine Statistical Survey of Households Bulletin: Demographic and Socio-Economic Data. Vol. I, Series 2 (Manila: National Economic Council - Bureau of the Census and Statistics, 1957), p. 28.

Table 2.a. -- Gross Fixed Investment in Durable Equipment, 1956
[Thousand Pesos]

Type of durable equipment	Imported durables							Locally manufactured durables				
	Imported capital goods (c.i.f.)[1]	Tax mark-up[2]		Trade mark-up[3]		Market Price		Gross product f.o.b.[4]	Trade Mark-up		Market Price	TOTAL
		Per Cent	Amount	Per Cent	Amount	Per Cent over c.i.f.	Value		Per Cent	Amount		
TOTAL	221,973	20	43,112	82	174,534	103	429,619	40,288	94	37,785	78,073	507,692
I. Machinery, except electrical and agricultural	134.122	20	26,811	61	81,828	81	242,761	1,411	61	861	2,272	245.033
II. Agricultural machinery and equipment	21,918	20	4,488	111	24,225	131	50,631	5,839	111	6,481	12,320	62,951
III. Electrical machinery and appliances	22,784	23	5,238	107	24,381	130	52,403	8,414	107	8,783	17,197	69,600
IV. Transport equipment	25,558	17	4,458	159	40,524	176	70,540	13,169[6]	110	14,909	28,078	98,618
V. Miscellaneous metal manufactures	7,591	25	2,117	50	3,576	75	13,284	11,455	50	6,751	18,206	31,490

---

[1] Obtained from the import statistics of the Central Bank. Values attributed to the household sector have already been removed.

[2] Computed from the compilation of import manifests of the Bureau of Customs

[3] Derived from a survey on mark-ups conducted on February 3, 1960.

[4] Obtained from the Philippine Statistical Survey of Manufactures 1956, National Economic Council, Bureau of the Census and Statistics.

[5] Assumed to be the same trade mark-up as the imported durables.

[6] Computed independently based on Central Bank prices.

Table 2b. Gross Fixed Investment in Durable Equipment, 1957
[Thousand Pesos]

Type of durable equipment	Imported Durables							Locally Manufactured durables				
	Imported capital goods (c.i.f.)[1]	Tax mark-up[2]		Trade mark-up[3]		Market Price						
		Per Cent	Amount	Per Cent	Amount	Per Cent over c.i.f.	Value	Gross product f.o.b.[4]	Per Cent	Amount	Market Price	TOTAL
TOTAL	269,119	20	53,845	110	564,281	130	618,126	1,863	96	1,781	3,643	621,769
I. Machinery, except electrical and agricultural	146,124	20	29,225	83	267,407	130	296,632	13	61	8	21	296,653
II. Agricultural machinery and equipment	25,129	20	5,206	126	56,791	146	61,817	388	111	431	819	62,636
III. Electrical machinery and appliances	28,738	23	6,610	118	62,649	141	69,259	548	107	586	1,134	70,393
IV. Transport equipment	60,916	17	10,356	172	165,691	189	176,047	500	[6] 110	550	1,050	177,097
V. Miscellaneous metal manufactures	8,212	32	2,628	43	11,743	75	14,371	413	50	206	619	14,990

---

[1] Obtained from the import statistics of the Central Bank. Values attributed to the household sector have already been removed.

[2] Computed from the compilation of import manifests of the Bureau of Customs.

[3] Derived from a survey on mark-ups conducted on February 3, 1960.

[4] Obtained from the Philippine Statistical Survey of Manufactures 1956 , National Economic Council, Bureau of the Census and Statistics.

[5] Assumed to be the same trade mark-up as the imported durables.

[6] Computed independently based on Central Bank prices.

only. These reports are gathered and compiled by the Bureau of Census and Statistics. The value of construction in the manufacturing industries was obtained from the survey of manufactures mentioned earlier. Non-residential construction expenditures in agriculture was obtained from the preliminary results of the survey on Agricultural Capital Formation conducted by the AED in 1956. Construction in the mining and utilities company, which were left out in previous estimates, were included in the present estimates. Investment in the mining industries consists of expenditures for structures in mine sites and mine shafts. Capital formation in the utilities companies consists of construction expenditures in connection with the laying of electric, gas, water, and railroad facilities. The required data were obtained from the financial reports of the mining and utilities companies. While it is desirable to include construction expenditures of radio and telegraph companies, no such estimate was included on account of unavailability of data.

The above new sources were used in the present estimate in place of the previous estimate which is believed to be seriously understated in coverage and valuation. The 30-70 ratio of construction in Manila and the so-called "rest of the Philippines" actually represents the areas requiring building permits for new constructions. This represents Manila, 28 cities and 5 suburban towns only, thus leaving out residential construction activities in more than one thousand municipalities and provincial capitals.[18] In the case of non-residential construction, the estimate was limited to areas requiring building permits. These types of construction -- manufacturing, commercial, institutional -- are generally undertaken in areas where permits are required. Non-residential construction in the areas not requiring building permits are generally agricultural buildings and improvement on lands. Inclusions of expenditures on these items as indicated by the survey on agricultural capital formation, is an improvement over the fixed ₱10 million assumed to be the value of annual non-residential construction in the farm.

Value of land development consists of expenditures for perennial crops, forest and fishpond development. Expenditures for perennial development were built from annual increase in acreage and the initial and recurring costs [till trees are of crop-yielding age] of development for each crop. Perennial crops considered were abaca, cacao, coconut, coffee, ramie, lanzones, mandarin, banana, papaya, other citrus, fruits and nuts, and kapok. Data on acreage were obtained from the survey of raw materials which was undertaken by the National Economic Council in 1957. Initial and recurring costs and land development were compiled from the studies made by the Bureau of Plant Industries and the schedule of crop loans prepared by the Development Bank of the Philippines.[19] Investments in the form of forest clearing and fishpond developments were obtained from the preliminary results of the survey on agricultural capital formation conducted in 1956.

---

[18] The 30-70 ratio was the proportion of the report on permit valuation for Manila and for the 28 cities and 5 suburban towns for the years 1950 to 1954 compiled by the Bureau of the Census and Statistics.

Capital formation in the form of government construction consists of expenditures on public buildings, highways, bridges, port works, military construction for civilian purposes, community development, and repair and maintenance. Separate estimates were made for construction of public corporations. Government construction statistics are readily obtainable from government accounts, although these are not presented in sufficient details to allow a thorough analysis of the various items of capital expenditures. Besides, data are available in fiscal years. The calendar year estimate was assumed to approximate the average of two consecutive fiscal years. Government expenditures on construction, exclusive of purchase of machinery, were obtained from the annual reports of the Auditor General for the fiscal years 1956 to 1958.[20] Construction expenditures by public corporations were compiled from the annual financial statements.

Changes in inventories. - Stock changes represent about 9 per cent of total gross domestic investment (Table 3). The estimate of changes in inventories is the weakest aggregate of capital formation. An improvement made in the present estimate over the previous totals was the increase of coverage and the adjustments in inventory valuation.

The measure of the value of increase in livestock follows the previous estimates which makes use of volume and value reports prepared by the Agricultural Economics Division.

---

[19] *The Raw Material Resources Survey, Volume I* -- Agriculture Part I, Table B; *Handbook of Agriculture, 1955.* Agricultural Economics Division: Manila.

[20] Report of the Auditor General, Comparative Consolidated Budget Statements.

Table 3. - CHANGES IN INVENTORY, 1956 and 1957
(Thousand Pesos)

Item	1955	1956	Book value change	Price deflator	1955 inventory in 1956 prices	Inventory change in 1956 prices	1957	Book value change	Price deflator	1956 inventory in 1957 prices	Inventory change in 1957 prices
TOTAL			123,389			107,261		104,410			83,008
Trade	92,071	106,374	14,303	[1]97.0	94,919	11,455	127,834	21,460	[1]95.8	111,038	16,796
Manufacturing	401,778	439,197	37,419	[1]97.0	414,204	24,993	482,197	43,000	[1]95.8	458,452	22,745
Mining	12,366	14,436	2,070	[2]94.8	13,044	1,392	16,575	2,139	[2]97.7	14,776	1,799
Agriculture			43,300			43,300		12,104			12,104
Livestock			37,446			37,446		6,793			6,793
Crops			5,854			5,854		5,311			5,311
Utilities[4]	[3]6,382	6,499	22	[4]98.2	6,499	....	6,426	73	[4]96.4	6,742	(316)
Government corporation	25,879	52,154	26,275	[5]99.4	26,033	26,121	77,788	25,634	[5]106.6	48,908	28,880
Book value change						123,389					104,410
Current value change						107,261					83,008
Inventory valuation adjustment						16,128					21,402

[1] Central Bank's general wholesale price index.
[2] Central Bank's general wholesale price of crude materials.
[3] Assumed.
[4] Central Bank's wholesale prices of manufactured goods.
[5] Implicit deflator.
[6] Except those corporations engaged in trade, manufacturing and utilities.

Changes in the value of inventories in trade, manufacturing and mining were estimated by applying inventory-sales and production ratios to gross sales and production, respectively. The inventory-sales ratio for trade was computed from the reports of trading establishments compiled by the Gross Sales Section of the Central Bank. The inventory-production ratio for manufacturing was derived from the survey of manufactures. Finally, the inventory for crops were obtained from the preliminary report of the survey on agricultural capital formation. To estimate trade and manufacturing inventories, the computed ratios were applied to total available goods and value of manufactures, respectively. Total available goods represent the sum of net imports and the values added by agriculture, manufacturing, forestry, and fishing. The manufacture of durable equipment forming part of capital formation were eliminated from the available goods total to avoid double counting the durable equipment that were already accounted for in the estimate of gross fixed investment. Inventories in the utilities and government corporations were obtained from their respective financial statements.

To estimate changes in inventories at replacement costs the different items of inventories were first revalued at current prices. Trade and manufacturing were deflated by the general wholesale price index. Mining was revalued by use of the general wholesale prices of crude materials. Utilities inventories was deflated by the general wholesale prices of manufactured goods. The inventories of public corporations were deflated by the wholesale price indexes of the commodities they handled. The difference between the book value changes and their respective changes in current prices represents the inventory valuation adjustments.

Gross domestic investments by industrial use. - In the interest of the users of capital formation statistics who would want the distribution of annual investment by industry, Tables 4a and 4b are presented on page 39.

Durable equipment were first allocated among the industries making use of them. An analysis of the combined lists of imported and manufactured durables was made. Machinery and equipment that could be identified as being used in any of the industrial groups were segregated and distributed among the appropriate industries. The remaining unallocated machinery and equip[illegible] were grouped into categories that may be distributed among any t [illegible] ree industries. Capital-expenditure ratios for the two or mo[illegible]stries just mentioned were derived by inferring from the pattern of investments of these industries

Table 4a. - GROSS DOMESTIC INVESTMENT BY INDUSTRY AND BY TYPE, 1956
(Million Pesos)

Industry	Total	Durable equipment			Construction				Changes in inventory		
		Total	Machinery	Transport	Total	Residential	Non-residential	Land dev.	Total	Private	Gov't. corp.
T O T A L	1,241.0	407.7	409.2	98.5	626.0	235.7	353.6	36.7	107.3	81.2	26.1
Agriculture	173.7	66.2	63.0	3.2	56.4	[4]	19.7	36.7	51.1	43.3	7.8
Mining	51.4	41.6	39.6	2.0	8.4	[4]	8.4	-	1.4	1.4	-
Manufacturing	261.3	207.6	197.7	9.9	28.7	[4]	28.7	-	25.0	25.0	-
Construction	41.3	33.7	32.1	1.6	-	[4]	-	-	7.6	-	7.6
Utilities	54.5	39.5	37.5	2.0	7.3	[4]	7.3	-	7.7	-	7.7
Transportation	65.1	63.0	-	63.0	[3]	[4]	-	-	2.1	-	2.1
Trade	63.0	4.9	4.7	0.2	46.6	[4]	46.6	-	11.5	11.5	-
Ownership of dwelling	234.2	-	-	-	234.2	234.2	-	-	-	-	-
Government	208.0	17.5	9.4	8.1	190.5	[4]	190.5	[5]	-	-	-
Public corporation	41.6	[1]	[1]	[2]	41.6	1.5	40.1	-	-	-	-
Services	46.9	33.7	25.2	8.5	12.3	[4]	12.3	-	0.9	-	0.9

[1] Durable equipment of public corporations are included in the private sector.

[2] Transport equipment of public corporations are included in the general government.

[3] Costs of body building are included in total cost of transportation units.

[4] All residential housing are included in ownership of dwelling.

[5] Included in public works.

Table 4b. - GROSS DOMESTIC INVESTMENT BY INDUSTRY AND BY TYPE, 1957
(Million Pesos)

Industry	Total	Durable equipment			Construction				Changes in inventory		
		Total	Machinery	Transport	Total	Residential	Non-residential	Land dev.	Total	Private	Gov't. corp.
T O T A L........	1,422.7	624.6	447.5	177.1	715.1	322.6	344.1	48.4	83.0	54.1	28.9
Agriculture	146.3	69.7	62.6	7.1	48.4	4/	–	48.4	28.2	12.1	16.1
Mining	49.8	42.7	38.4	4.3	5.3	4/	5.3	–	1.8	1.8	–
Manufacturing	322.6	263.2	236.5	26.7	35.7	4/	35.7	–	23.7	23.7	–
Construction	49.5	44.5	40.0	4.5	–	4/			5.0	–	5.0
Utilities	57.4	42.2	37.0	5.2	10.5	4/	10.5	–	4.7	(0.3)	5.0
Transportation	106.8	105.2	–	105.2	–	4/	–	–	1.6	–	1.6
Trade	67.3	8.9	8.0	0.9	41.6	4/	41.6	–	16.8	16.8	–
Ownership of dwelling	321.4	–	–	–	321.4	321.4	–	–	–	–	–
Government	221.1	17.0	9.0	8.0	204.1	4/	204.1	5/	–	–	–
Public corporation	27.6	1/	1/	2/	27.6	1.2	26.4	–	–	–	–
Services	52.9	31.2	16.0	15.2	20.5	4/	20.5	–	1.2	–	1.2

[1] Durable equipment of public corporations are included in the private sector.
[2] Transport equipment of public corporations are included in the general government.
[3] Costs of body building are included in total cost of transportation units.
[4] All residential housing are included in ownership of dwelling.
[5] Included in public works.

in 1948.[21] These ratios were applied to the corresponding machinery and equipment to arrive at an estimated distribution of these equipment among the industries. The items that were easily identified were agricultural implements, mining and manufacturing machinery and implements, and medical instruments. Among the items that were allocated by the use of capital expenditure ratios were office machines and generators. Capital expenditures of the government on machinery were assumed to be on construction machinery. Data were obtained from the Report of the Auditor General.[22] To avoid double counting, expenditures of the government on construction machinery was deducted from total construction machinery listed in gross fixed investment. Transport equipment were also allocated by industry of use. Transport equipment used in the transportation industry were easily determined. The motor vehicle registration gives information on the number of motorvehicles issued licenses for transportation of passengers and cargo. All airplanes, ships, and railroad equipment were assumed to be used in the transportation industry. The motor vehicle registration also gives indication on the number of vehicles used by the government and of the service industries. The rest of the transport equipment were prorated among the other industries using the percent distribution of machinery purchased.

Basic data on the value of construction are available in the form desired for the classification of investment by industrial use. Residential dwellings were assigned to the industry "ownership of dwelling". Construction undertaken by establishments in trade, manufacturing, services, and utilities are also available individually. Expenditures on repair and alteration were prorated among the various industrial sectors on account of unavailability of detailed breakdown of these expenditures. All costs of land development were assigned to agriculture. The aggregate falling under construction industry are those of machinery and transport equipment used by the industry in undertaking construction work for other industries.

The value of the changes in inventories are also easily analyzed. Values of changes in stocks of crops and grains were assigned to agriculture. The value of changes in inventories in mining, manufacturing

---

[21] Economic Census of the Philippines, pp. 284, 356, 560, 604, 286, 364 and 627.

[22] Report of the Auditor General, Comparative Consolidated Statements, Schedule F.

208

and trade were assigned to their respective industries. Changes in inventories in construction, utilities, transportation, and services, represent the inventories of materials in the public corporations.

CONCLUSION

This work is far from perfect. Many of the basic weaknesses commonly found in capital formation estimates in underdeveloped areas are still present in the above measure. However, attempts have been made to improve on the areas where serious deficiencies lie. The objectives to improve the estimate from the point of view of coverage and valuation were substantially achieved. This is especially significant since any improvement made on the estimate of capital formation will also reflect an equal improvement in the aggregate private consumption expenditures and household savings as shown in the national accounts of the country.

The present estimates of capital formation for the years 1956 and 1957 are higher by about 40 per cent than those reported for the same years in past estimates. This was due mainly to the improved valuation of durable goods and the inclusion of items of capital formation not heretofore included.

In spite of these significant improvements, the writer believes that the level of investment as brought out in this work is still underestimated. There are many items that need to be included. The lack of statistical data is still the main drawback in the estimate of capital formation in the Philippines. Researches must be made to improve the classification systems in order to draw clearly the boundaries of capital formation and consumption, construction and equipment, and major and minor repairs. Unless steps along these lines are pursued vigorously, the problems of underestimation and duplication will always be present in the estimates. A program has to be evolved to review present sources, to modify available statistics and to institute new series.

TIME TREND ESTIMATES OF NET VALUE ADDED IN ORGANIZED MANUFACTURING

by

Roberto S. Mariano
School of Economics
University of the Philippines

To estimate the percentage share of each of the eighteen industry groups in total net value added in manufacturing at current prices, projections of net value added at constant prices by industry group are separately obtained by OSCAS for the organized and the unorganized sectors. These projections are then inflated to obtain estimates at current prices. For the organized sector the method of projections used is a simple linear regression on time of net value added (at constant prices) in each industry group. For a particular group, the ratio of the estimated value to the cumulated total is taken as the percentage share of that industry group. A similar regression is performed for the whole organized manufacturing sector to estimate total net value added in the organized sector which is then allocated to the various groups according to the ratios computed earlier.

This method of projection for the organized sector can be improved to a certain extent. For one thing, scatter diagrams over time for net values added in the different groups generally indicate non-linear time trends so that regressions on time other than linear should be tried. For purposes of getting very short-run estimates of simply the percentage shares of various industry groups in total net value added, the use of non-linear time trend estimates may lead to more reasonable preliminary results. However, such a procedure assumes a smooth pattern of growth (or decay) and does not completely take into account changes in the economy which can affect production levels or costs of production in the various industries in such a non-uniform way as to cause radical shifts in the composition of total net value added in manufacturing. To incorporate the effects of such changes on percentage as well as on absolute levels of net value added in the different industry groups, relevant economic variables, in addition to or in place of time, may be used as explanatory variables for net value added; or going one step farther, a simultaneous equations model can be constructed to describe the interrelationships among net value added and other relevant economic variables.

This paper deals with non-linear time trend estimates for net value added in organized manufacturing and discusses the effects of these new estimates on the composition of total net value added. As indicated earlier, such an approach does not explicitly take into account the hidden interactions in the data as, for example, an econometric model could. However, this simplistic approach can serve as a preliminary study which hopefully will shed more light on the behavior of net value added in organized manufacturing in the past twelve to fourteen years.

In addition to the linear, two non-linear forms were considered: the parabolic and exponential. The regressions obtained for these three forms are reported in Tables 1 to 3.

Table 1. Linear Regressions of Organized Manufacturing Net Value Added (at constant 1955 prices) on Time (1956-68) 1/

	Industry Group	α	β	t-value	$\bar{R}^2$
1.	Food	222.115	15.445	9.14	.87
2.	Beverages	78.885	11.511	8.19	.85
3.	Tobacco	54.885	5.489	5.34	.70
4.	Textiles	40.192	9.610	10.74	.91
5.	Footwear	41.731	.610	.92	-.03
6.	Paper	10.039	4.071	4.90	.66
7.	Printing	23.231	4.495	9.79	.89
8.	Leather	3.654	.060	1.08	.01
9.	Rubber	8.808	2.236	5.07	.67
10.	Chemicals	62.231	9.846	9.57	.88
11.	Wood and Cork	30.962	5.082	6.53	.78
12.	Furniture and fixtures	11.769	.330	3.37	.46
13.	Non-Metallic Mineral Products	14.385	8.176	12.27	.93
14.	Metals	21.654	10.643	9.00	.87
15.	Machinery (except electrical)	14.231	.374	.48	-.07
16.	Electrical Machinery	5.038	6.005	13.63	.94
17.	Transport Equipment	15.962	2.269	6.27	.76
18.	Miscellaneous	103.038	5.192	3.40	.47
	Total	763.231	101.352	10.55	.90

1/The regression equations are of the form

$$Y = \alpha + \beta t$$

where Y is net value added (at constant 1955 prices) in million pesos and t = 1 for 1956, t = 2 for 1957, ..., t = 13 for 1968.

Table 2. Exponential Regressions of Organized Manufacturing Net Value Added (at constant 1955 prices) on Time 1956-68)[1]

Industry Group	α	β	t-value	$\bar{R}^2$
1. Food	5.440	.049	8.10	.84
2. Beverages	4.534	.071	10.93	.91
3. Tobacco	4.106	.057	5.80	.73
4. Textiles	3.948	.095	10.56	.90
5. Footwear	3.746	.010	.78	.03
6. Paper	2.833	.103	6.29	.76
7. Printing	3.290	.093	7.80	.83
8. Leather	1.262	.018	1.30	.05
9. Rubber	2.388	.102	5.17	.68
10. Chemicals	4.321	.074	14.72	.95
11. Wood and Cork	3.620	.076	7.76	.83
12. Furniture and Fixtures	2.474	.023	3.01	.40
13. Non-Metallic Mineral Products	3.343	.118	16.98	.96
14. Metals	3.622	.120	10.41	.90
15. Machinery (except electrical)	2.782	-.012	-.31	-.08
16. Electrical Machinery	2.528	.164	7.27	.81
17. Transport Equipment	2.893	.074	6.93	.80
18. Miscellaneous	4.676	.035	3.78	.52
Total	6.776	.069	15.74	.95

---

[1] The regression equations are of the form

$$\text{Ln}\, Y = \alpha + \beta t$$

where Y and t are as defined in Table 1 and Ln Y is the natural logarithm of Y.

Table 3. Parabolic Regressions of Organized Manufacturing Net Value Added (at constant 1955 prices) on Time (1956-1968) [1]

Industry Group	α	β	γ	$\bar{R}^2$
1. Food	209.337	20.557 (2.74)	-.365 (-.70)	.87
2. Beverages	105.372	.917 (-.17)	.757 (2.02)	.88
3. Tobacco	76.406	-3.119 (-.83)	.615 (2.36)	.79
4. Textiles	48.895	5.729 (-1.48)	.277 (.03)	.91
5. Footwear	54.580	-4.530 (-1.80)	.367 (.10)	.23
6. Paper	23.832	-1.446 (-.43)	.394 (-1.70)	.71
7. Printing	16.623	7.138 (3.75)	--.189 (-1.43)	.90
8. Leather	3.497	.123 (.49)	-.005 (-.26)	-.08
9. Rubber	11.797	1.040 -(.53)	.085 (.63)	.65
10. Chemicals	89.260	-.965 (-.31)	.772 (3.59)	.94
11. Wood & Cork	42.238	.572 -(.18)	.322 (1.44)	.80
12. Furniture & Fixtures	13.133	-.216 (-.53)	.039 (1.37)	.50
13. Non-Metallic Mineral Products	30.608	1.686 (.77)	.464 (3.06)	.96
14. Metals	38.280	3.993 -(.81)	.475 (1.39)	.88
15. Machinery (except Electrical)	23.462	-3.319 (-1.00)	.264 (1.14)	-.04
16. Electrical Machinery	2.993	6.824 (3.43)	-.058 (-.42)	.93
17. Transport Equipment	15.280	2.542 -(1.55)	-.019 (-.17)	.74
18. Miscellaneous	118.965	-1.178 (-.18)	.455 (.99)	.47
Total	924.564	36.819	4.609	.92

[1] The regression equations are of the form $Y = \alpha + \beta t + \gamma t^2$ where Y and t are as defined in Table 1.

By comparing the t-values, the adjusted multiple correlation coefficients, and the Durbin-Watson statistics in these three groups of regressions, we arrive at the following forms as giving the (relatively) best fit:

		$\bar{R}^2 =$
1. Food	Parabolic	.87
2. Beverages	Exponential	.91
3. Tobacco	Parabolic	.79
4. Textiles	Exponential	.90
5. Footwear	-	-
6. Paper	Exponential	.76
7. Printing	Parabolic	.90
8. Leather	-	-
9. Rubber	Exponential	.68
10. Chemicals	Parabolic	.94
11. Wood & Cork	Exponential	.83
12. Furniture & Fixtures	Parabolic	.50
13. Non-Metallic Mineral Products	Exponential	.96
14. Metals	Exponential	.90
15. Machinery (except electrical)	-	-
16. Electrical Machinery	Parabolic	.93
17. Transport Equipment	Exponential	.80
18. Miscellaneous	Exponential	.52
Total	Exponential	.95

The linear form does not appear in the above listing at all. The main basis for choice are the $\bar{R}^2$ values. In cases where the $\bar{R}^2$'s for two or three forms do not differ too much from each other, the significance of the t-values and the Durbin-Watson statistics are taken into account. Most of the $\bar{R}^2$ values reported above are high enough to indicate a fairly reasonable fit. For Rubber (9), Furniture and Fixtures (12), and Miscellaneous (18), the chosen regression forms resulted in $\bar{R}^2$ which are lower than those obtained for the other groups. For groups 5, 8 and 15, none of the three forms gave reasonable $\bar{R}^2$ values.

The estimated net values added (in million pesos at 1955 prices) based on the above chosen regression equations are as follows :

Table 4. Estimates based on the Selected Regressions

Industry Group	1968		1969		1970	
	NVA	% share	NVA	% share	NVA	% share
1. Food	415	18.8	426	17.9	435	17.1
2. Beverages	234	10.6	252	10.6	270	10.6
3. Tobacco	140	6.4	153	6.5	167	6.6
4. Textiles	178	8.1	195	8.2	215	8.5
5. Footwear	73	3.3	78	3.3	84	3.3
6. Paper	65	2.9	72	3.0	80	3.1
7. Printing	77	3.5	80	3.4	81	3.2
8. Leather	5	0.2	6	0.3	6	0.2
9. Rubber	41	1.9	46	1.9	51	2.0
10. Chemicals	207	9.4	227	9.6	248	9.8
11. Wood & Cork	100	4.6	108	4.5	116	4.6
12. Furniture & Fixtures	17	0.7	18	0.8	18	0.7
13. Non-Metallic Mineral Products	131	5.9	148	6.2	167	6.6
14. Metals	178	8.0	201	8.5	227	8.9
15. Machinery (except Electrical	46	2.1	48	2.0	50	2.0
16. Electrical Machinery	82	3.8	87	3.7	92	3.6
17. Transport Equipment	47	2.1	51	2.2	55	2.2
18. Miscellaneous	169	7.7	175	7.4	181	7.0
Computed Total	2205	100.0	2371	100.0	2543	100.0

For Footwear (5) and Leather (8), estimated values were obtained by adjusting the computed parabolic values so that the estimate for 1968 coincide with the actual value. For Machinery (15), the average annual increment of 2 from 1962 to 1968 was used to get rough estimates for 1969 and 1970.

One can compare the above estimates with what would have been obtained if linear time trends were used. The projections under a linear regression are as follows:

Table 5. Estimates Based on Linear Regressions

Industry Group	1968 Estimate	1968 % share	1969 Estimate	1969 % share	1970 Estimate	1970 % share
1. Food	423	20.3	438	20.1	454	20.0
2. Beverages	229	11.0	240	11.0	252	11.0
3. Tobacco	126	6.1	132	6.0	137	6.0
4. Textiles	165	7.9	175	8.0	184	8.0
5. Footwear	50	2.4	50	2.3	51	2.2
6. Paper	63	3.0	67	3.1	71	3.1
7. Printing	82	3.9	86	3.9	91	4.0
8. Leather	4	0.2	5	0.2	5	0.2
9. Rubber	38	1.8	40	1.8	42	1.8
10. Chemicals	190	9.1	200	9.2	210	9.2
11. Wood & Cork	97	4.7	102	4.7	107	4.7
12. Furniture & Fixtures	16	0.8	16	0.7	17	0.7
13. Non-Metallic Mineral Products	120	5.8	129	5.9	137	6.0
14. Metals	160	7.7	171	7.8	181	7.9
15. Machinery (except electrical)	19	0.9	20	0.9	20	0.9
16. Electrical Machinery	83	4.0	89	4.1	95	4.2
17. Transport Equipment	45	2.2	48	2.2	50	2.2
18. Miscellaneous	171	8.2	176	8.1	181	7.9
Cumulated Total	2081	100.0	2184	100.0	2285	100.0

Before ending this paper we can make the following remarks based on the tables presented here.

The exponential regressions reported in Table 2 also give an indication of the rates of growth of value added in each industry group. The β -coefficient can be thought of as an estimate of the average annual rate of growth in each group for the period 1956-68 (since $\beta = \frac{d \ln Y}{dt}$). Thus, net value added in Food has increased at an average annual rate of 5% from 1956 to 1968, Beverages with a rate of 7%, Tobacco 6%, etc. How good these estimates are will of course depend on the goodness of fit of the regression lines from which they are derived. By looking at the graphs included in the appendix as well as the $\bar{R}^2$'s in Table 2, we can say that these β -values may be adequate for industry groups 1-4, 6, 7, 9, 10, 11, 12, 13, 14, 16, 17. For group 5 (Footwear), the computed $\bar{R}^2$' has an extremely low value; the β-value of 1% is a result of averaging up and down fluctuations in net value added for 1956-1968 and is a low estimate for the average percentage increase exhibited in the graph from 1967 on. The same remark holds for group 8 (Leather), 15 (Machinery), and 18 (Miscellaneous).

As for the estimates obtained from the selected regressions (Table 4), it seems that for 1968 we will have underestimates for groups 1-10, 11, 14, and 18, and close estimates for groups 12, 13, 16, 17. The selected estimates of actual levels of net value added for 1968 are also generally higher than the linear ones (exceptions to this are groups 1, 7, 16, and 18). However, when we compare the two sets of estimated percentage shares, we see that there is hardly any difference. Thus, while the use of non-linear trends results in some changes in estimates of actual levels, it will hardly lead to any shifts in the estimated composition of net value added.

Reproduced from The Philippine Economic Journal, Volume V, No. I,
First Semester, 1966

THE USEFULNESS OF THE EXISTING NATIONAL ACCOUNTS FOR THE ANALYSIS OF THE PHILIPPINE ECONOMY*

Statistical Data Requirements of Economic Analysis

Before proceeding to the discussion of the Philippine national accounts themselves, it may be useful to dwell briefly on the statistical data requirements of economic analysis in general.

These requirements naturally vary with the stage of development and the particular situations in which countries find themselves. All countries are presumably concerned to maintain a rate of economic growth that is commensurate with, if not in advance of, the rate of increase of the population. But granting this, the importance attached to growth by policy makers in the economically advanced countries will generally be matched by at least equal concern for the maintenance of existing high levels of aggregate output and employment --accompanied by a maximum possible degree of price stability. In developing countries, on the other hand, existing levels of output and employment are far indeed from constituting policy targets in themselves, and the main emphasis is squarely and unequivocally on securing high rates of growth and development. Price stability too is not unfrequently sacrificed, at least in part, in order to attain these objectives.

Following this distinction, great importance may therefore attach in advanced countries to current and accurate information on, for example, manufacturing inventories (particularly of durables) in order to keep track of fluctuations in aggregate demand and to anticipate their possible repercussions on output and employment. In the primarily agricultural economies of developing countries, similar data on manufacturing inventories will not usually be so vital as to warrant the allocation of scarce statistical resources to their collection and compilation, and it is possible to make do with far cruder estimates.

The same statistical series may also serve different analytical purposes in different countries. Economically advanced countries will be interested, for example, in current information on the programmed capital expenditures of business enterprises during, say, the coming six or twelve months -- again for purposes of assessing their probable impact on output, employment and prices. In developing countries where most items of machinery and equipment are usually imported from abroad, such information could only serve, perhaps, as a rough indicator of expected growth or of possible future pressure on the balance of payments or international reserves.

---

* Paper presented to the Department of Economics, University of the Philippines, September 11, 1964.

These few examples can serve to underline the dangers involved in the uncritical adoption by one country of the statistical patterns and series of other countries. It cannot be over-emphasized that the problem of statistical programming is fundamentally an economic problem, calling for an optimum allocation of scarce resources of funds and professional manpower among competing statistical ends. The optimum will naturally vary between countries, according to their different stages of development and corresponding analytical requirements.

GROWTH AND DEVELOPMENT

Another distinction which should be made when considering the statistical data requirements and estimating methods employed in developing countries is that between "growth" and "development".

A "growing" economy may be defined, simply, as an economy characterized by a rising national or per capita national product. It is true, of course, that all growth is accompanied by or gives rise to structural changes and adjustments in the economy. But such changes and adjustments are largely incidental to the process of growth, and at least in the short and medium run are not likely to be pronounced.

A "developing" economy, however, is one in which not only the national product is increasing but one in which the industrial composition of the product is undergoing considerable change. It may not perhaps be too much to say that the rate at which this change is occurring is itself a measure of the rate at which development is proceeding.

The basic structural change indicative of a developing economy is usually a decline in the relative weight of agricultural net product in the total national product, and a corresponding rise in the weights of manufacturing, construction and services. But beneath the surface, other changes are occurring which are generally of a more profound nature. With the introduction of new crops and production techniques in agriculture, the relative composition of agricultural net output and input may change considerably, together with the absolute and relative level of farm income. This may be still more true of manufacturing, where new industries are being established and domestic production progressively deepened. At the same time, the process of development will be reflected in the emergence of a growing wage and salary earning class whose share in the total national income may be expected to increase steadily.

The implications of these factors for national income estimating in developing countries will be analyzed later, following consideration of national accounts requirements in general.

REQUIREMENTS OF NATIONAL ACCOUNTING

If they are to be regarded as fulfilling their purpose adequately, the national accounts should provide with a tolerable degree of reliability three categories of information on the major aggregates of interest:

(a) the absolute size of the aggregate
(b) secular trend
(c) short-term changes and fluctuations

Accurate information on the absolute size of the aggregates is a patent pre-requisite of any analysis of the inter-relationships existing between them, such as capital-output ratios, capital formation and nation saving, private consumption and disposal income, government consumption and the gross national product, etc. Information on absolute magnitudes is also necessary for most purposes of market analysis and research.

Similarly, without a reasonably reliable picture of secular trend over, say, the past ten or fifteen years, it is difficult if not impossible to form an opinion as to how the economy is performing, in which direction it is moving, and whether medium and long-term targets are being achieved. Such information is also an indispensable basis for sound projections into the future. Without reliable estimates of aggregate and per capita rates of growth of the national product, private consumption expenditure, capital formation, etc. in the past, it is quite impossible to make informed guesses about what is likely to happen in the future, and attempts to do so will unavoidably take on something of the nature of a game of chance.

For purposes of current policy guidance, however, the most important set of information is that on short-term changes and fluctuations. In the absence of reliable knowledge of the rate of growth of aggregate product or of product in the major branches, for example, the monetary authorities will be extremely hard put to decide on the type of credit policy called for by the current situation. For even without subscribing to the quantity theory of money in toto, such knowledge must nevertheless constitute an essential ingredient of informed decision-making in this field.

In certain of the more advanced countries, the required information is provided not only on an annual basis but by quarterly deseasonalized national accounts. In most other countries, especially developing countries, the compilation of such accounts is usually ruled out by lack of sufficient data and resources, so that the emphasis is primarily on the measurement of the changes occurring from year to year.

It is unfortunately not always realized that the provision of accurate information on annual change makes by far the most heavy demands on the national accounts framework and on those engaged in their compilation. Given a minimum of basic data and a measure of resourcefulness and initiative, it should not usually be over-difficult to obtain a fairly reliable picture of the orders of magnitude of the main national aggregates in a particular base year. Similarly, the accounts do not have to be over-sophisticated in order to provide a general picture of trend over the past ten or fifteen years. In comparatively stable economies, it may be possible to obtain such a picture even when estimating on the basis of fixed assumptions and coefficients.

It is quite another thing, however, for national income estimators to be able to state with confidence whether the gross national product in a given year rose by 4, 6, or 8 per cent as compared with the previous year. Still more is this the case as regards gross or net product in a particular branch. In order to be able to do this, the accounts must be compiled in the maximum possible detail. Global calculations and, more specifically, the use of fixed assumptions and coefficients, must be dropped in all but unavoidable marginal cases. This is because, even in developed economies, the changes recorded from one year to the next may also be a function of irregular factors unpredictable in advance. The operation of such factors may be conveniently illustrated by reference to the agricultural branch, although it is clear that similar factors may frequently be operative in other branches too.

Let it be assumed that in the base year (1), which was also a "normal" year from the point of view of rainfall, temperatures, pests, etc., value added in agriculture was 90 per cent of the value of gross output of the branch, i.e., non-factor inputs amounted to 10 per cent of the value of output. Let it now be further assumed that in the following year (2) exactly the same productiin patterns and techniques were employed, that exactly the same quantities and types of non-factor inputs were used and that the prices of those inputs remained unchanged. The only variable factor on the input side was that rainfall and temperatures were exceptionally favourable, so that the physical output obtained from the same volume and value of non-factor inputs was greater than in the base year (1). Depending on elasticities, the aggregate value of current farm output will also be greater, therefore, than in year (1) -- which means that value added will now amount to more than 90 per cent of the value of output. Application of a fixed 90 per cent ratio to the value of current output would thus result in an understatement of the derived estimate of value added for the current year. The opposite would be the case in a climatically unfavorable year, i.e., the estimate of value added would be overstated. As will be evident from the numerical example on page 138, the use of a fixed coefficient in these circumstances actually operates in the direction of ironing out the year-to-year fluctuations, thereby over-modifying the picture of development in the branch.

		Year		
		1	2	3
I.	Value of output	100	120	80
	Value of non-factor input	10	10	10
	Value added	90	110	70
	Value added as a percentage of the value of output	90%	91.7%	87.5%
	Increase in value added as compared with previous year	-	+22.2%	-36.4%
II.	Value added calculated as 90% of value of output	90	108	72
	Increase in value added as compared with previous year	-	+20%	-33.3%

NATIONAL ACCOUNTING IN DEVELOPING COUNTRIES

The structural changes and adjustments associated with the process of development add considerably to the problems and pitfalls of national accounting in developing countries. To fulfill their purpose properly, the accounts of such countries should be designed and constructed so as to take account of and reflect these changes adequately. This is necessary not only because information on such changes is itself an indicator of the rate and direction of development, but because failure to take account of them in estimating procedures will often lead to the emergence of a distorted picture of economic performance. This means that the employment of fixed coefficients and assumptions, such as the percentage of value added in the various branches or the geographical distribution of new construction, must be largely ruled out even for purposes of ascertaining orders of magnitude and secular trend -- except in marginal cases, and then, for limited periods only. Failure to observe this rule must mean, in practice, that the estimators are begging the questions that they should be answering, i.e., to what extent are these coefficients and relationships actually undergoing modification as a result of the development process.

The principal factors contributing to the modification and outdating of economic coefficients and relationships include changes in technology and capital intensitivity, changes in production and input patterns and changes in the geographical distribution of population and capital formation. The mode of operation of these factors is generally well-known and need not be elaborated upon further. An important influence may also be exerted, however, by changes in relative prices, the significance of which may be sometimes over-looked. Value added in a particular branch of manufacturing, for example, is a function, among other things, of the relative prices received and paid per unit of output and input. To the extent that these prices move differently, therefore, the percentage of value added in the branch will also be affected. The same applies to relative changes in wage, interest and profit rates, which will affect the relative distribution of the national income by factor shares. The importance of such price changes may be especially great in developing countries, where prices in general and relative prices in particular are frequently less stable over time than in developed countries.

In summary, therefore, the paradoxical situation exists whereby developed countries, with their wealth of basic and current statistics, may nevertheless find it possible to construct tolerably accurate accounts, at least for a limited number of years, on the basis of fixed coeficients and assumptions. It is precisely in developing countries, where both the volume and quality of available statistics is usually limited, that reliance on similar methods may be most dangerous. It is apparent, therefore, that the burden and responsibility devolving on the national accounts departments in developing countries are especially great. If the national accounts are to serve a useful purpose and justify their cost of preparation, estimators in these countries should display a maximum of initiative and imagination in seeking out sources of information and devising methods of estimation. It will also be evident that, in addition to their statistical training, they should be familiear with at least the basic concepts and principles of economic organization and structure.

THE PHILIPPINE NATIONAL ACCOUNTS

A detailed critique of the official national accounts estimates of the Philippines is contained in the Reports on Economic Statistics in the Philippines, prepared by the World Bank Resident Mission in 1964-65. It will not be possible within the framework of the present paper to do more than indicate a few of the main points and conclusions. Before proceeding, I should state that in many respects the Philippine national accounts are already at a high level, compared with many other developing countries. However, given the wealth of statistical knowledge and experience existing in the Philippines, it does not appear unreasonable to expect standards approximating rather those found in more developed countries. The critical tone of much of what follows should therefore be interpreted against this background.

It may be said at the outset that a great many of the potential deficiencies of national accounts in developing countries that have been outlined previously are detectable in the official estimates of the Philippines.

The keystone of the Philippine national accounts framework is the national income estimate, which is obtained as the sum total of value added in each economic branch. With the exception of the Government sector, the factor payments making-up value added (i.e., wages, salaries and supplements, interest, rent and net profit) are not estimated separately for each branch. Instead, value added is obtained, explicitly or implicitly, as a global figure by applying fixed percentages to the estimated value of gross output in each branch. The percentages used are in nearly all cases those originally calculated by the U. N. Advisory Expert Mr. W. I. Abraham for the years 1948-1951. Two implicit assumptions and results of this method of estimating may be noted:

1. The size and accuracy of the value added estimate is directly dependent on the size and accuracy of the estimate of gross output.
2. The annual percentage change in value added is identical with that determined for gross output.

The method thus rules out in advance the possibility of detecting and reflecting changes in the aggregate size and relative factor composition of value added by branch, resulting from factors such as technological and relative price changes, irregular short-term fluctuations, etc. Probably of more practical import, however, is the fact that, with the possible exception of the agricultural branch, the estimates of gross output which form the basis for calculating the size and change in value added in the various branches are themselves seriously deficient.

This may be illustrated by reference to the two branches of manufacturing and construction.

MANUFACTURING

Up to 1960, the value of gross output in manufacturing was obtained as the product of the estimated average annual value of output per establishment in each sub-branch, and the estimated number of establishments operating in these sub-branches. Inspection reveals, however, that:

1. The average annual value of output per establishment was not obtained from a probability sample but from "cooperating establishments" comprising mainly large establishments in the greater Manila area.
2. The population of establishments used for inflating these averages apparently included mainly establishments with 5 or more workers only.
3. No reliable information was available as to the changes in the number of establishments operating each year.

As a result, the estimates of gross output in manufacturing up to 1960, and hence the derived figures for value added, must be regarded as being of a very low order of reliability, both as regards their absolute level and the annual changes recorded in them. The available evidence would appear to indicate that they are biassed downwards considerably.

As from 1961, the branch estimates of value added in manufacturing have been obtained as extrapolations of the 1960 estimates, on the basis of the index of physical production in manufacturing and the index of wholesale prices. But here, too, the improvement is more apparent than real. Seeing that no correction has been made to the 1960 figures, the cumulative error in the absolute level of the estimates up to this date has been carried forward, by the process of extrapolation, into the estimates for subsequent years. Moreover, the index of physical production in manufacturing does not reflect the increase in production attributable to new establishments that began operations subsequent to the index base year (1955), and neither do the establishments supplying the data constitute a probability sample.

CONSTRUCTION

The gross value of output of the construction branch is obtained as the sum of "private construction" and "other construction". The value of private construction is estimated for all years on the assumption that the permit value of construction of all categories in Manila, i.e., residential and non-residential, constitutes 30 per cent of the national total. In other words, the permit value of construction in Manila divided by 30 and multiplied by 100 gives the estimate for the whole of the Philippines. This ratio is also the one calculated and employed by W. I. Abraham for the years 1948-1951.

The use of this ratio, unchanged, for a period of some 15 years must introduce a very wide margin of error into the global estimate for the country as a whole. For it would appear probable not only that the ratio has been subject to long-term change over the years but also to irregular short-term fluctuations. Apart from this, the figures of permit value of construction in Manila, which form the basis of the global calculation, are themselves biassed downwards considerably, owing to the fact that virtually constant square metre prices have been used for many years now by the Manila Engineer's Office for converting permit area into permit value. The global estimate for the country as a whole is thus understated to at least the extent of the rise in building prices over the years.

"Other construction" consists, in principle, mainly of central and local government construction expenditures and non-residential farm construction. In practice, however, the large bulk of such expenditure by local government has been omitted from the estimates. At the same time, the value of farm construction has been estimated for all years at 10 million pesos annually, which is the same figure calculated by W. I. Abraham for 1948-1951. It is apparent, therefore, that the estimate for "other construction" too must be understated considerably.

On the basis of other indicators, it appears that the estimates of total output of the construction branch may well be understated by as much as one third or more. It is also apparent, therefore, that the annual changes implicit in the estimates must be regarded as of very low significance.

The estimating procedures and deficiencies of the estimates of gross output in manufacturing and construction may be taken as typical of the estimates for most other branches. Seeing that value added by branch is obtained as a fixed percentage of the estimated value of gross output, it is clear that both the absolute level and the recorded annual changes in the branch estimates and in total national income must be regarded with very great reserve. These same considerations apply with equal force to the estimates of gross national product, which are derived directly from the national income estimate by adding net indirect taxes and depreciation.

WAGES AND SALARIES

Granting the deficiencies and weaknesses of the present national income estimates, it must be admitted that it would be difficult at the present time to prepare good estimates of net profits by branch -- although it should be possible to do so for the other component items of "returns to capital", i.e., interest and rent. However, there would appear to be no sound reason why independent estimates of wage and salary payments should not be compiled from data available from or existing in the files of the Social Security System, the Bureau of Internal Revenue and other sources.

Information on the size and growth of the national wage bill and its weight in the total national income can serve, in developing countries, as an important indicator of the rate and direction of economic development and of the extent to which local market is emerging for the products of the new domestic industries. Independent branch estimates of wages and salaries could also serve as valuable checks on the orders of magnitude of the existing global figures for value added by branch, and of the estimate of total national income.

At the present time, no reliable information whatsoever is available even as regards the total national wage bill. A figure does indeed appear in the official national accounts, but it is derived as a fixed (1948) percentage of the total national income, estimated as described previously.

PRIVATE CONSUMPTION EXPENDITURE

No independent estimate of private consumption expenditure is at present available. The figure appearing in the official national accounts is obtained as a residual, by subtracting from the total value of the gross national product and imports the sum total of government consumption expenditure, domestic capital formation and exports. It embodies, therefore, the net errors of all the component estimates of the national accounts framework, and must be regarded as of very low reliability from the point of view both of absolute size and the recorded annual changes.

The absence of an independent estimate of private consumption expenditure is probably the most serious single deficiency in the present official accounts -- and this not only because such information is essential for many analytical and policy purposes. Until an independent estimate is compiled, it will remain impossible to derive an alternative estimate of the gross national product from the expenditure side of the accounts, i.e., as the difference between the sum of private consumption expenditure, government consumption expenditure, capital formation expenditure and exports on the one hand, and imports on the other. An alternative estimate arrived at in this way would provide an invaluable check on the accuracy of the present estimate obtained primarily as the sum of value added by branch.

GROSS DOMESTIC CAPITAL FORMATION

As has been indicated, the construction component of domestic capital formation may be understated by as much as one third or more. The estimate of machinery and equipment, on the other hand, would appear to be much more reliable. However, construction accounts for some 33 per cent of the total value of capital formation according to the official estimates, so that the understatement in the value of total capital formation on this account alone is presumably not less than 10-15 per cent.

Further serious errors are introduced into the capital formation estimates by the methods of inventory estimation employed. The figures for inventory change are derived mechanically, as fixed percentages of the value of gross output or value added. They are grossly understated as evidenced by the fact that the increase in manufacturing inventories in 1960, as ascertained by the Survey of Manufactures for the same year, amounted to 180 million pesos, whereas, the figure given in the official estimates is [illegible] million pesos only.

All factors taken together, the understatement in the estimates of total gross domestic capital formation may well exceed 20 per cent. Little confidence may be placed moreover, in the annual rates of change emerging from these estimates.

REST OF WORLD ACCOUNT

The data in the Rest of World Account are taken without adjustment from the official Balance of Payments estimates. This means that no corrections are made for smuggling or for the other limitations of the official figures of merchandise trade, although this could perhaps be done on the basis of the published foreign trade figures of the countries with which trade connections are maintained by the Philippines. The imports of the Philippine Armed Forces are also omitted in all years.

The estimates for the various services items are compiled in the main from the daily reports of the commercial banks, and must be regarded as weak; while no distinction is made between international transfers received on current or capital account. As a result, the balancing item in the Rest of the World Account "net lending

Best Available Document

abroad", which embodies the net error in the other items of the account, must be regarded as of dubious reliability. Seeing that this item measures in principle the extent of capital export or import into the economy, a serious gap consequently exists in economic knowledge.

CAPITAL AND SAVINGS ACCOUNT

The residual savings estimates derived from the national accounts framework are regarded in all countries as being of a low standard of reliability. This is because such estimates necessarily embody the net errors implicit in the entire accounting framework.

In the case of the present estimates, it will be evident from what has been said that they cannot be regarded as possessing the minimum degree of reliability necessary to render them a tool of economic analysis. The possible margin of error inherent in them is so great as to destroy their significance, both as regards orders of magnitude and development over time.

EMMANUEL LEVY

Statistical Advisor, World Bank Mission, Manila
World Bank Resident Mission to the Philippines

Reproduced from The Philippine Economic Journal, Vol. IX, No. 2 (Second Semester 1970), pp. 157-181.

THE REVISED PHILIPPINE NATIONAL ACCOUNTS

M. L. Treadgold*

I. INTRODUCTION

Although it has long been recognized that the standard of the Philippine national accounts has been quite high by comparison with the standards of national accounts in many other developing countries, there has also been an awareness that the Philippine accounts have had various deficiencies, some quite major. These have been highlighted by a number of writers, /2/ /4/ /5/ /8/ and /11, esp. p. 76n/. However, recently the National Economic Council's Office of Statistical Coordination and Standards (OSCAS) has published a set of revised accounts for the years 1946-1967, inclusive, /6/ which supersedes all previous estimates. Methodologically, these latest revisions are of considerable importance because of the fundamental nature of the changes which have been made in some estimating techniques. In addition, they are noteworthy for the fact that they cover the whole of the postwar period.

The national accounts will undoubtedly receive much use in the analysis of current problems facing the Philippine economy and in the interpretation of recent Philippine economic history. Some assessment of them is therefore in order. Accordingly, although it is not intended that this paper should form a comprehensive critique, we shall undertake a brief review of the major modifications in estimation procedures, consider the quantitative significance of some of the revisions, and outline a number of deficiencies which continue to appear or have newly emerged in the revised estimates.

---

*Research Fellow, The Research School of Pacific Studies, The Australian National University.

232

II. CHANGES IN SOURCES AND METHODS

In terms of format the revised national accounts differ little from the old. There are still five actual accounts, all in terms of current prices. These are a national production (income) and expenditure account, three sectoral income and current outlay accounts, and an overall capital account. The three sectoral accounts relate to the personal sector,[1] the government sector, and current foreign transactions. There also remain a variety of supporting tables, the most noteworthy of which are those showing total product by industry of origin at current and constant factor cost and expenditure on GNP at constant market prices.

However, within this broad format there have been many changes in estimating procedures and data sources. As these have been outlined in the introductory letter and technical notes which were published with the revised accounts and as some will be considered subsequently in the section dealing with the deficiencies of the revised accounts, the following discussion will be quite short and by no means exhaustive.

(a) An Independent Estimate of Personal Consumption

The most outstanding methodological difference between the old and the revised national accounts is the introduction in the latter of a direct, independent estimate of personal consumption expenditure. In the old accounts a single estimate of GNP at current market prices was obtained by first summing net value added or factor incomes for each industrial sector in order to obtain an estimate of net national product at factor cost, and then adding to this aggregate estimates of total depreciation or capital consumption allowances and total indirect taxes less subsidies. The sum of independent estimates of government current outlays on goods and services, gross domestic investment and net export and investment income[2] was subsequently subtracted from GNP to obtain a residual estimate of personal consumption expenditure. This residual necessarily embodied the net errors involved in the measurement of GNP and in the measurement of the other items of final expenditure.

---

[1] In fact, the personal sector account has actually replaced an appropriation account relating to the whole of the private sector, i.e., an account which included pre-tax corporate profits less the payment of dividends on the income side, and corporate taxes and undistributed profits on the outlay side. However, latter data still appear elsewhere in the revised accounts.

In the new accounts, by contrast, consumption has been estimated directly, with the result that two independent estimates of GNP have been obtained, one from the side of value added and one from summing the various types of final expenditure. Because the OSCAS considers that the value-added estimate of GNP is the more accurate of the two, the statistical discrepancy between the estimates is shown as a balancing item on the expenditure side of the national production and expenditure account. Within the sectoral accounts it appears as an item on the expenditure side of the personal income and outlay account. In this account, personal saving is found residually as the difference between personal disposable income (estimated by adjusting total net value added for corporate income, taxes, transfers, etc.) and the sum of personal consumption and the above statistical discrepancy. This procedure reflects the apparent view of OSCAS that the statistical discrepancy was (in the main) probably a reflection not merely of errors in the expenditure estimate of GNP, but specifically a reflection of errors in the direct measurement of personal consumption [6, p. 25].

---

[2] Net export and investment income equalled (exports of goods and nonfactor service − imports of goods and nonfactor services) + (investment income from abroad − investment income paid abroad).

The above change in methodology relates to current price data. However, the provision of a direct estimate of personal consumption expenditure at current prices has also enabled two estimates of GNP at constant prices to be made. One is built up (in similar fashion to the estimates in the old official accounts at least for years after 1959) from figures of real value added in each industrial sector. The other is estimated by summing the deflated components of final expenditure on GNP. As in the current price case, the former estimate is preferred, so that the table showing expenditure on real GNP contains a constant price statistical discrepancy item.

(b) The Value-Added Approach to Estimating GNP

Another important area of change has been in the sources and methods employed to build up estimates of GNP at current prices from estimates of net value added in each industrial sector. The net value added of a sector is now defined as being equivalent to that part of net domestic product at factor cost originating in the sector. This subaggregate is considerably easier to measure than the concept of sectoral value added employed in the old accounts; namely, the contribution of the sector to net national product (national income). Moreover, in estimating the sectoral components of net domestic product the OSCAS has taken full advantage for the first time of data supplied by the Annual Surveys of Manufactures (which have been conducted since 1956), household surveys of the labor force and family income and expenditure, and the Economic Census of 1961. This census has provided relatively recent, sectoral benchmark estimates of value added and the ratio of value added to the gross value of production. A number of these have been used in the making of extrapolated estimates of total value added for various sectors in nonbenchmark years.

The sum of the sectoral estimates of net value added yields an estimate of net domestic product at factor cost which is expanded into an estimate of GNP at market prices by adding to it estimates of total net factor income from abroad, indirect taxes less subsidies, and depreciation or capital consumption allowances. In the old accounts a fixed annual depreciation allowance of ₱230 million was imputed for that part of the fixed capital stock in the form of private construction. In the revised accounts, the estimates for depreciation of private construction appear to have been adjusted (although in a manner which has not been made completely explicit) to allow for the effects of capital formation and differences in the economic lives of buildings.

(c) The Measurement of Gross Capital Formation

It has been a widely held opinion that the procedures used to estimate capital formation in the old national accounts were seriously inadequate and resulted in a considerable understatement of this aggregate.[3] The revised accounts, however, embody some radically different estimating procedures for gross domestic investment at current prices.

---

[3] In 1964 Levy [5, p. 144] suggested that the degree of understatement of domestic capital formation may well have exceeded 20 per cent.

Within the construction component of capital formation, the revised estimates of private nonfarm construction investment for the years after 1954 have been derived from data on the permit value of construction in a sample of 25 cities and from annual increases in real property assessments. Formerly, expenditure on private nonfarm construction was estimated as a constant multiple of the permit valuation of private construction in Manila alone (adjusted after 1959 by the index of retail prices of construction materials). The method of estimating farm construction has also changed. Whereas in the old accounts this form of investment was assumed to have amounted to a fixed annual value of ₱10 million, the OSCAS has now estimated it by extrapolating through time the results of a survey of capital formation in agriculture.

Another area of revision is in the post-1955 estimates of investment in durable equipment. The major procedural changes here appear to have been the use of the Annual Surveys of Manufactures as sources of information on the domestic production of durable equipment and the use of new mark-up ratios (obtained from a 1964 survey of importers of durable equipment) in the valuing of imported equipment at domestic prices.

Finally, there appears to have been one significant methodological development in the measurement of inventory investment. In the revised national accounts, estimates of the change in inventories held by the manufacturing sector have apparently been based directly on data from the Annual Surveys of Manufactures. Previously, estimates of inventory change in manufacturing were obtained by means of the unrealistic assumption that inventories were a constant percentage of the level of activity in that sector. For other nonagricultural sectors the latter type of procedure has, however, continued to be used to estimate inventory change, although the actual percentages have been revised for at least some years in the light of data provided by the 1961 Economic Census.

(d) The Valuation of Foreign Transactions

The estimates of the values of current foreign transactions in both the old and revised national accounts are derived from the balance of payments summaries of current transactions prepared by the Central Bank of the Philippines. The latter data are compiled in terms of U.S. dollars, thus necessitating their conversion into pesos.

In preparing the old national accounts, the pre-1960 data were converted to pesos at the then prevailing official exchange rate of ₱2.00 for U.S. $1.00. However, commencing in 1960 the Philippines implemented a multiple exchange rate system which, with a number of modifications, was to last until 1965, the last year for which the old national accounts were published. For this period there existed the problem of which exchange rates to use in the conversion of the data to pesos. The rates eventually chosen for 1960-62 were hypothetical ones calculated by extrapolating the prewar exchange rate forward to 1960-62 in accordance with a purchasing power parity index derived from the relative movements of Philippine and U.S. wholesale prices [7, p. 22]. These so-called unitary rates, there being one for each of the three years, were applied to all outward and inward current foreign transactions. They did not bear any conceptual relation to the variety of multiple rates which actually prevailed in these years. Subsequently, for 1963-65, all estimated current receipts and outlays were converted to pesos for national accounting purposes at ₱3.89 per U.S. $1.00 and ₱3.91 per U.S. $1.00, respectively, which were the prevailing free market buying and selling exchange rates. This approach ignored the fact that over most of this period nearly all merchandise export receipts were in reality converted to pesos at an effective exchange rate of only ₱3.51 per U.S. $1.00.[4]

In estimating the revised national accounts, the OSCAS has abandoned these procedures for converting the 1960-65 dollar foreign transactions data into pesos and apparently replaced them by a procedure in which estimates of the relevant exchange rates which actually prevailed during this period are used for calculating the peso equivalents of the dollar measures of the various foreign transactions. In fact, prevailing exchange rates seem to have been used throughout the period 1946-67. Thus, the old official exchange rate of ₱2.00 per U.S. $1.00 appears to have remained in use for converting dollar data relating to the years prior to 1960.

(e) Income Distribution and Investment Composition

To conclude this brief summary of some of the major changes in methodology, we shall consider the omissions from the revised accounts of previously published information on the distribution of factor income and on the composition of gross investment.

---

[4] Central Bank of the Philippines, Circular No. 133 (January 21, 1962) introduced the condition that only 80 per cent of merchandise export receipts could be converted to pesos at the free market exchange rate. The remaining 20 per cent had to be surrendered to the Central Bank at the old official rate of ₱2.00 per U.S. $1.00. On December 1, 1964 this restriction was modified to exempt some minor export products, and on November 6, 1965 it was abandoned completely.

In the old national accounts, national income (or net national product at current factor cost) was divided into four major components: compensation of employees (which was further subdivided into employee compensation earned in the agriculture sector and in all other sectors), entrepreneurial and property income of persons (which was similarly subdivided into its agricultural and nonagricultural elements), private corporate income (or undistributed corporate profits plus direct corporate taxes), and property income of government. In the revised accounts the latter two components remain, but the first two have been lumped together into one component corresponding to total personal factor income.

The reason for this change would seem to lie in a recognition of the inadequacy of part of the old method of estimating the shares of employee compensation and entrepreneurial and property income of persons in national income. This method involved, as a first step, the subtraction of independent estimates of private corporate income and property income of government from the national income total, as calculated by the value-added, or industrial-origin, approach. The result was an estimate of personal factor income. This aggregate was then divided into compensation of employees and entrepreneurial and property income of persons according to constant ratios derived from the 1948 Census. Specifically, it was assumed that in each year compensation of employees amounted to 44 per cent, and entrepreneurial and property income of persons to 56 per cent, of personal factor income. Finally, these two parts of personal factor income were subdivided into their respective agricultural and nonagricultural elements by use of the assumption that employee compensation originating in agriculture was a fixed 28 per cent of all income originating in agriculture (as estimated by the value-added approach) and that entrepreneurial and property income of persons accounted for the remaining 72 per cent of income in that factor.

Clearly, the use of fixed percentages to calculate total employee compensation and entrepreneurial and property income of persons means that the estimates of these two types of income were of negligible worth. There are no grounds for assuming that their proportionate shares in the total factor income received by persons were constant. Accordingly, provided that there were no alternative means of estimation available, the procedure followed in the revised accounts of not breaking down personal factor income into these two types of income, but instead merely calculating the distribution of total factor income among the corporate sector, the government sector, and the personal sector as a whole (by the same method as employed in the old accounts), is at least in this respect a justifiable one.

The other area of omission in the revised accounts concerns the estimates of the composition of investment at current prices. The old accounts classified gross domestic investment by type of asset and, within this grouping, also classified gross fixed investment in durable equipment by type of equipment. In addition, they classified gross domestic investment by type of purchaser (public or private) and gross fixed investment by industrial use (i.e., according to the industrial sectors in which it occurred). However, in revising the national accounts, the OSCAS omitted the last two classifications.

As with the omissions from the distribution data, these omissions are justifiable, provided that it was not possible to use estimating techniques which were superior to those employed in the old accounts. Thus, consider gross domestic investment classified according to whether it was undertaken by the public or private sector. In the old accounts the estimates of public investment covered only government construction activities. The reason for this understatement was an alleged inability to identify separately that part of investment in durable equipment which was undertaken by the public sector. Because of this inability all investment in durable equipment was treated (erroneously) as part of private investment.

The data on gross fixed investment classified by industrial use, which was published for the years 1956-65 in the old national accounts, was also of very doubtful quality. The main shortcoming related to the industrial allocation of investment in durable equipment. Part of this subaggregate was allocated among industrial sectors by means of the criterion that particular kinds of equipment were likely to have been used in only certain sectors while other parts were allocated according to fixed percentages derived from the Economic Census of 1948.

III. THE MAGNITUDE OF THE REVISIONS

In this section we shall examine the quantitative importance of some of the data revisions which have resulted from the changes in sources and methods. In order to avoid the discussion becoming too unwieldy, attention will be concentrated on three of the more strategic variables; namely, GNP at current prices, GNP at 1955 prices, and capital formation at current prices. Our comparisons of the old and revised estimates of these variables will not extend past 1965, since this is the last year for which the old estimates are available.[5]

With regard to the method of approach, Levy has suggested that, for a set of national accounts to fulfill its purpose adequately, it should provide tolerably reliable information on three aspects of each of the major aggregates it purports to measure. These are the absolute size of each aggregate, its secular trend, and short-term changes and fluctuations in it [5, p. 136]. In the present context these three aspects will be used as a framework for comparing the old and revised estimates.

(a) GNP at Current Prices

Figure 1 shows graphically on a logarithmic scale the old and revised estimates of GNP at current prices for the years 1946-65. It is apparent that for this period the differences between the old and revised estimates are for the most part not very great, if they are considered in relation to the absolute levels of the estimates. In fact, with the exceptions of 1947 and 1948 when the revised estimates fall short of the old estimates by a little over 11 per cent, the percentage discrepancy between the absolute levels of the estimates (measured as the absolute difference between them expressed as a percentage of the old estimate) fluctuates within a range of only − 6.2 per cent to + 7.2 per cent. For the period as a whole the average discrepancy (calculated as the arithmetic mean of the

---

[5] Following the OSCAS procedure, the revised figures for GNP at current and constant prices examined in this section are those estimated by the value-added approach.

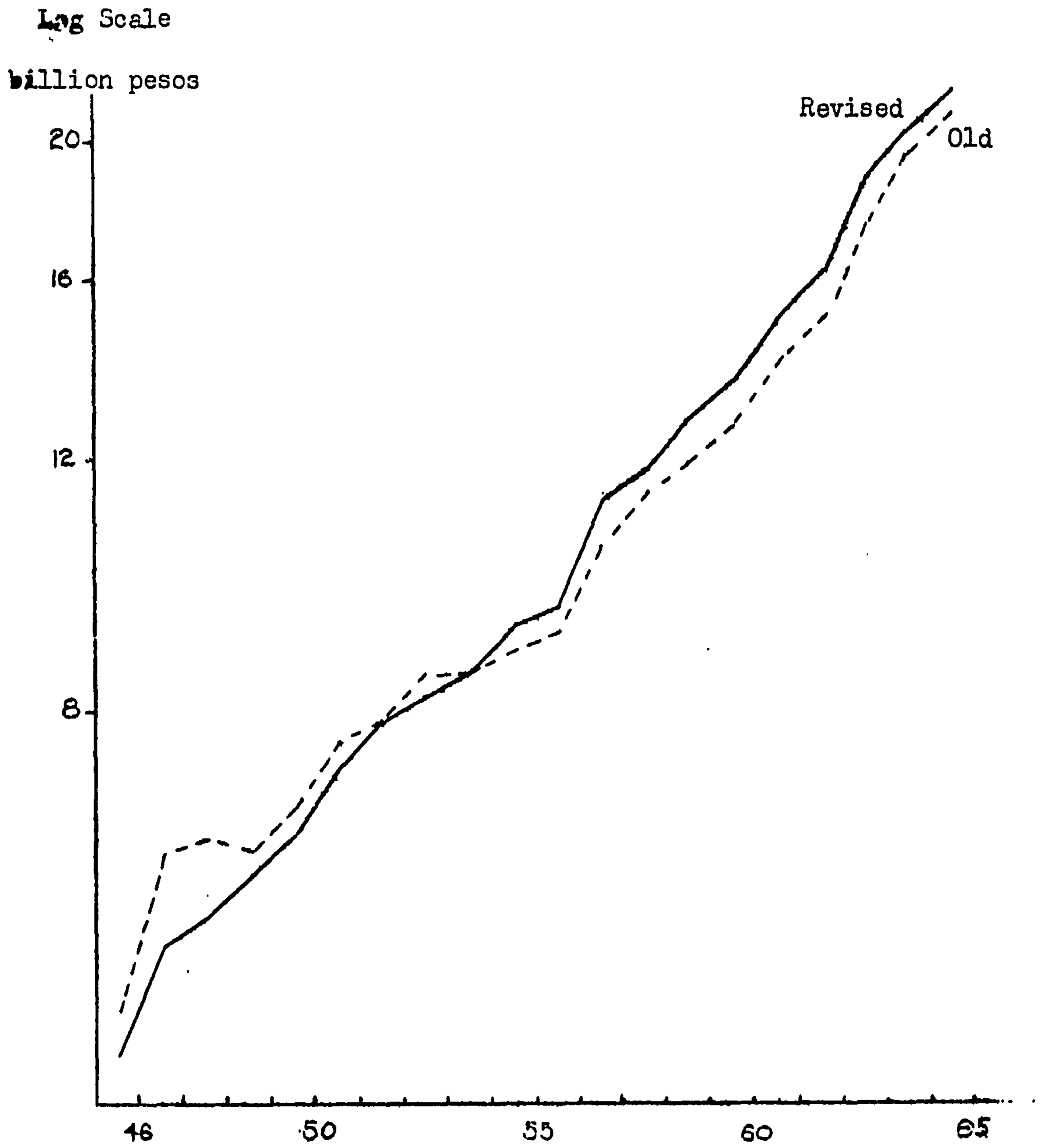


Figure 1
OLD AND REVISED ESTIMATES OF GNP AT
CURRENT MARKET PRICES, 1946-65

annual percentage discrepancies, regardless of sign) amounts to only 4.8 per cent.

In terms of long-run trends, GNP at current prices followed, according to both series of estimates, an upward path which took it to a level in 1965 which was between four and five times greater than its 1946 level. If the immediate postwar year of 1946 is ignored, it appears (again according to both series of estimates, but less so in the case of the revised ones) that the annual rate of increase of GNP at current prices tended to accelerate over the long run.

Finally, there is the question of short-run changes and fluctuations. These can be measured somewhat crudely by the percentage year-to-year changes in the aggregate. Judged by this yardstick, the pattern of short-run change according to the revised estimates is quite similar to that according to the old estimates. With the principal exception of 1947-50, the two alternative measures of the annual rate of growth of GNP at current prices tend to a large extent to vary together through time. Moreover, apart from 1946-47 and 1948-49, the absolute levels of these rates of change never differ by more than three percentage points. Some idea of the similarity of the short-run behavior of the two series after the early postwar years can be obtained from Figure 2. (For reasons of scale this figure does not show the old and revised estimates of the rate of growth of GNP at current prices between 1946 and 1947. These were 27.7 per cent and 21.0 per cent, respectively.)

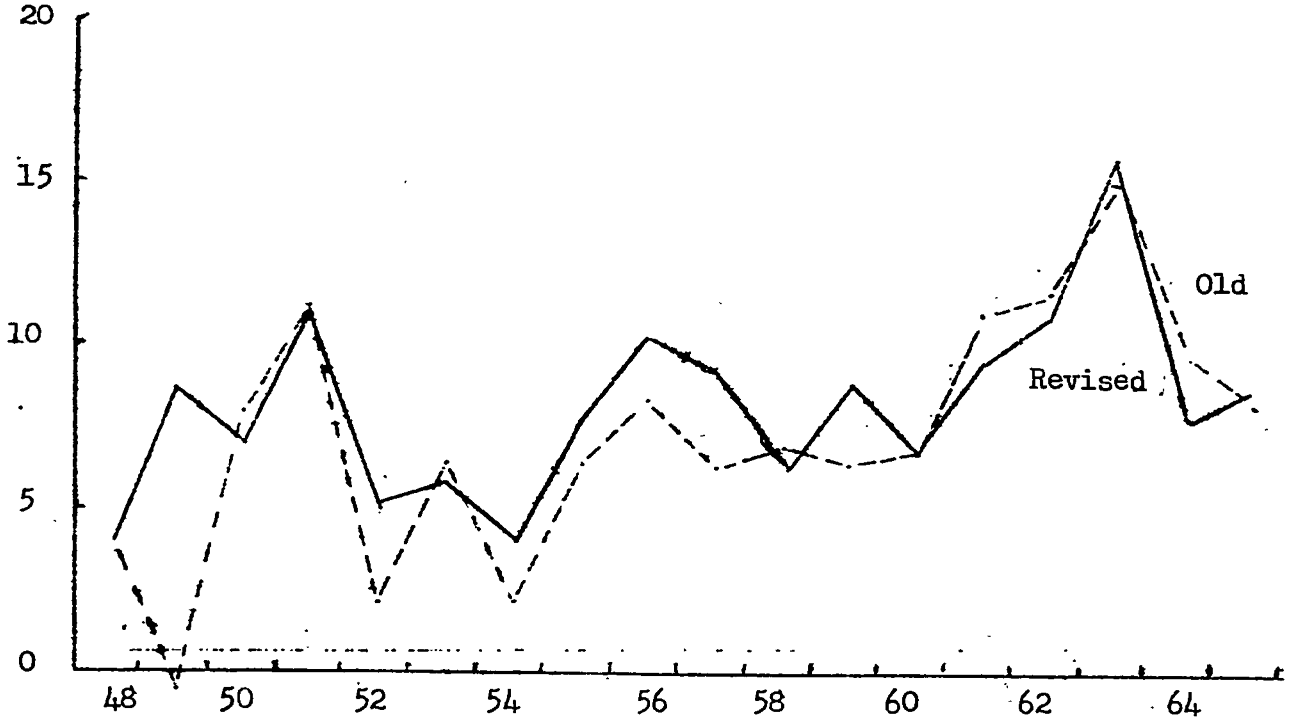


Figure 2
OLD AND REVISED ESTIMATES OF ANNUAL PERCENTAGE CHANGES
IN GNP AT CURRENT PRICES, 1948-65

(b) GNP at Constant Prices

Figure 3 compares the revised estimates of GNP at 1955 prices with the old estimates.[6] It can be seen that, similarly to the data relating to GNP at current prices, the revised estimates exceed the old estimates from 1954 on. Prior to that year they fall short of the old estimates in every year except 1946. Apart from that exception, this behavior is also similar to that of the current price data. However, for the majority of years the absolute level of the revised constant price estimate diverges proportionately more from the absolute level of the old constant price estimate than is the case with the corresponding current price data. In 1946 and 1947 the revised constant price estimates successively exceed and fall short of the old by as much as 23.6 per cent and 13.2 per cent, respectively, while over the remaining years through to 1965 the percentage discrepancy between the estimates moves within the range of - 8.3 per cent to + 9.4 per cent. The average discrepancy for the years 1946-65 (calculated as the arithmetic mean of the annual percentage discrepancies, regardless of sign) is 5.9 per cent, which is somewhat higher than that found for the current price data.

With regard to long-run change, the revised data suggest that real GNP followed an upward trend, but a trend whose rate of increase tended

---

[6] It should be noted that the original OSCAS estimates of GNP at 1955 prices covered only the period from 1955 to 1965. The old estimates of GNP at 1955 prices for earlier years back to 1946, which are also shown in Figure 2, were prepared by Trinidad /10/. However, judging from their original place of publication and the subsequent reproduction of some of them in the United Nations' Yearbook of National Accounts Statistics, Trinidad's estimates appear to have been accepted officially, and these have been so treated in this paper.

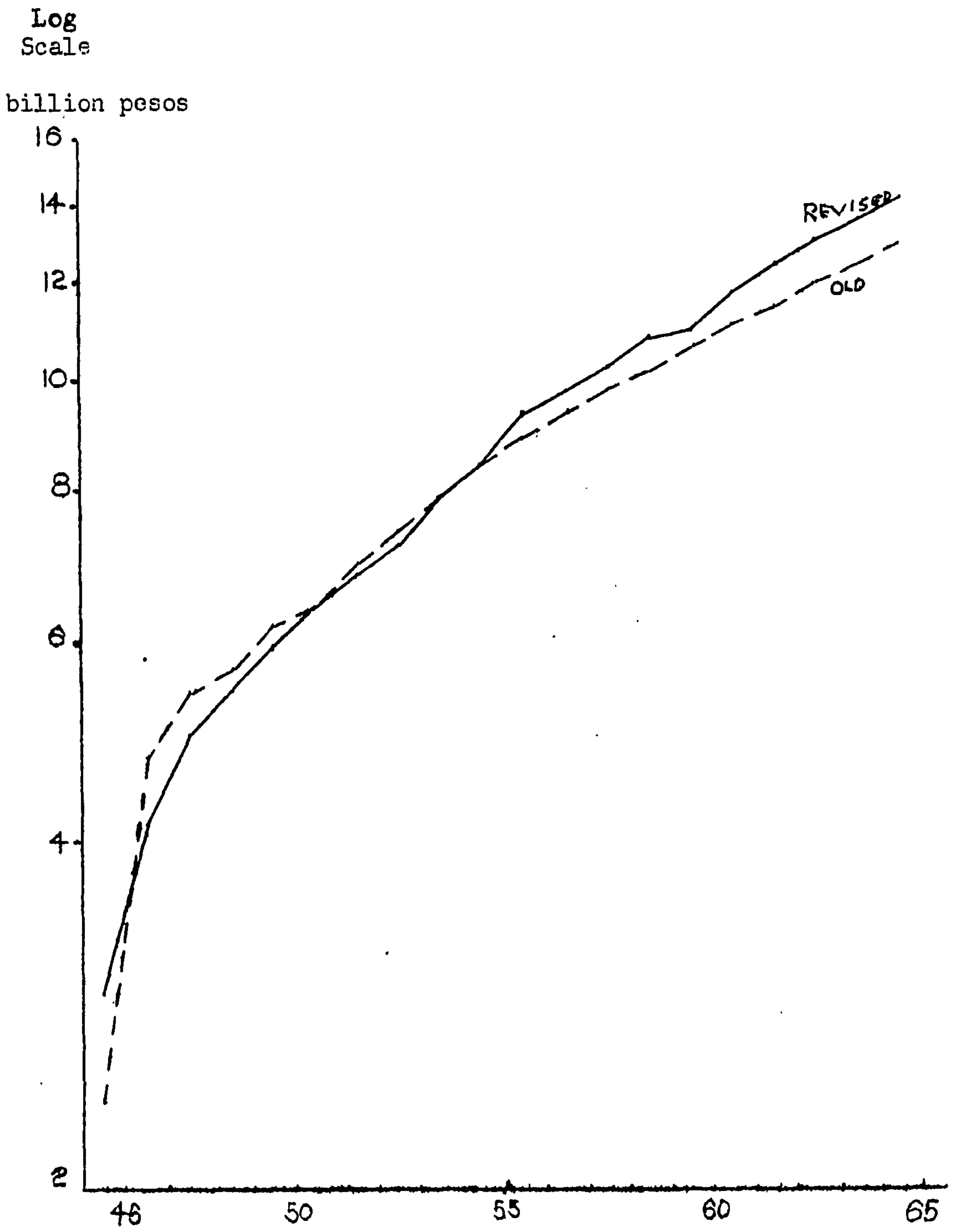


FIGURE 3

OLD AND REVISED ESTIMATES OF
GNP AT 1955 PRICES, 1946-65

to decelerate over time. Although this form of behavior corresponds broadly with that portrayed by the old data, the deceleration suggested by the revised data appears to be considerably more gentle than that suggested by the old data. This reflects the fact that the revised estimate of the real rate of growth for the very disturbed postwar period 1946-47 is much lower than the original estimate and the fact that, on the other hand, for subsequent years the revised estimatesof the rate of growth tend on the average to be higher than the original estimates of the rate of growth. Incidentally, if it is accepted that the revised estimates are the more accurate, this latter tendency confirms the view that the old estimates understate the rate of growth of the Philippine economy over the nineteen-fifties and early sixties. (Cf. [4, p. 8]and [12].)

Figure 4 shows the old and revised estimates of the annual percentage rates of growth of GNP at 1955 prices for the period up to 1965. (Again, for reasons of scale, the estimates for 1946-47 are omitted.) In addition to illustrating some of the differences and similarities in long-term trends, this figure highlights the nature of the short-run changes in each of the two real GNP series. Thus, it indicates that until about 1958 the year-to-year changes in the revised estimates of the rate of growth of real GNP are for the most part larger than those in the old estimates of the rate of growth of real GNP. They also form less of a cyclical pattern. On the other hand, after 1958 the revised estimates of the rate of growth show a more pronounced cyclical pattern whose magnitude exceeds that of the old estimates.

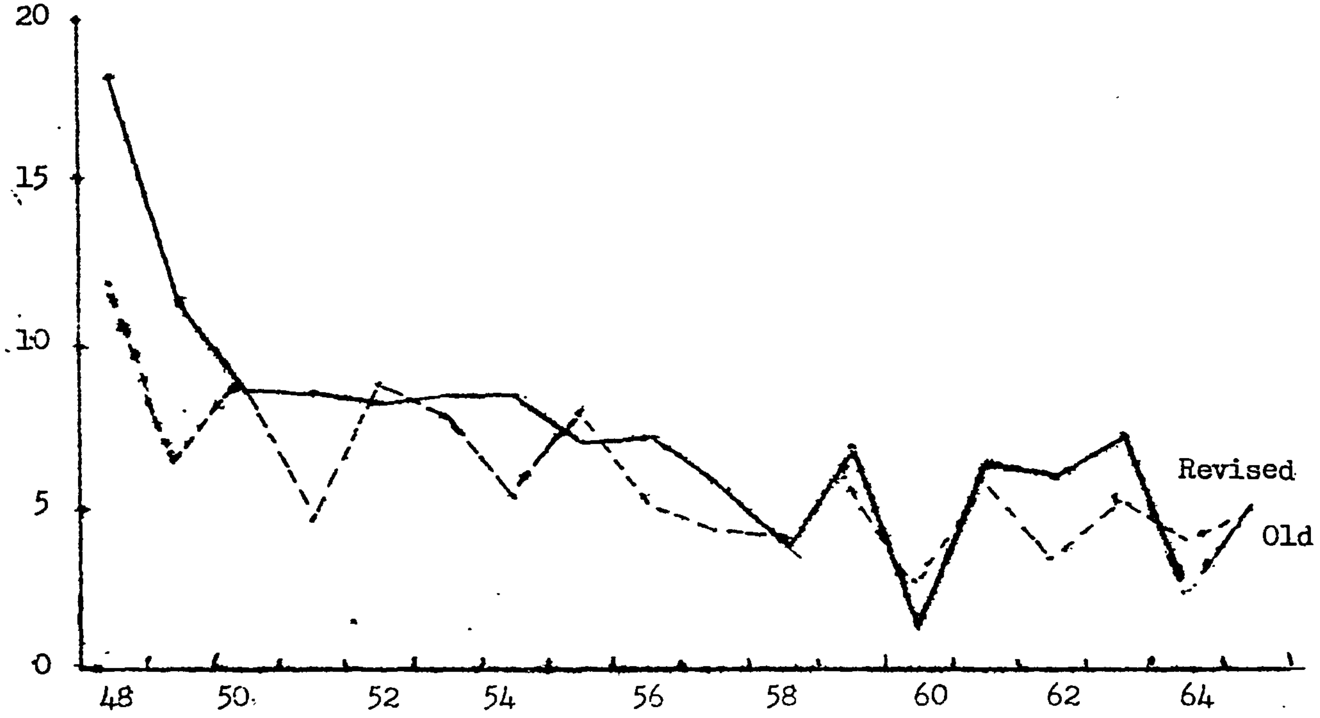


Figure 4
OLD AND REVISED ESTIMATES OF ANNUAL PERCENTAGE
CHANGES IN GNP AT 1955 PRICES, 1948–65

(c) Gross Domestic Capital Formation

We consider lastly the differences between the old and the revised estimates of gross domestic capital formation. Our attention will be concentrated on the current price estimates rather than the constant price ones. It is the method of deriving the former which has experienced the more important changes; and, subject to some alterations in deflation procedures, the quantitative impact of these changes is reflected directly in the differences between the old and revised constant price estimates.

In every year of the period 1946-65 the revised estimate of the absolute level of gross domestic capital formation exceeds substantially the corresponding old estimate. In percentage terms, the excess ranges from a low of 35.4 per cent in 1949 to a high of 74.5 per cent in 1959. The average percentage discrepancy or excess is 51.4 per cent. However, the patterns of short-run change (measured by percentage year-to-year variations) and the long-run trends in the two series are quite similar. With regard to trends, both series rise to early postwar peaks in 1948, decline to low levels in the early 1950's, and then rise at an accelerating trend rate over the remainder of the period. By 1965 both the old and revised estimates have increased by about eight-fold over their respective 1946 levels.

For some analytical purposes it is perhaps more useful to examine the behavior of rate of investment (i.e., total investment expressed as a percentage of GNP or some similar aggregate) than the behavior of the level of investment alone. Accordingly, Figure 5 shows for the years 1946-65 the rate of investment, as calculated from the revised national-accounts

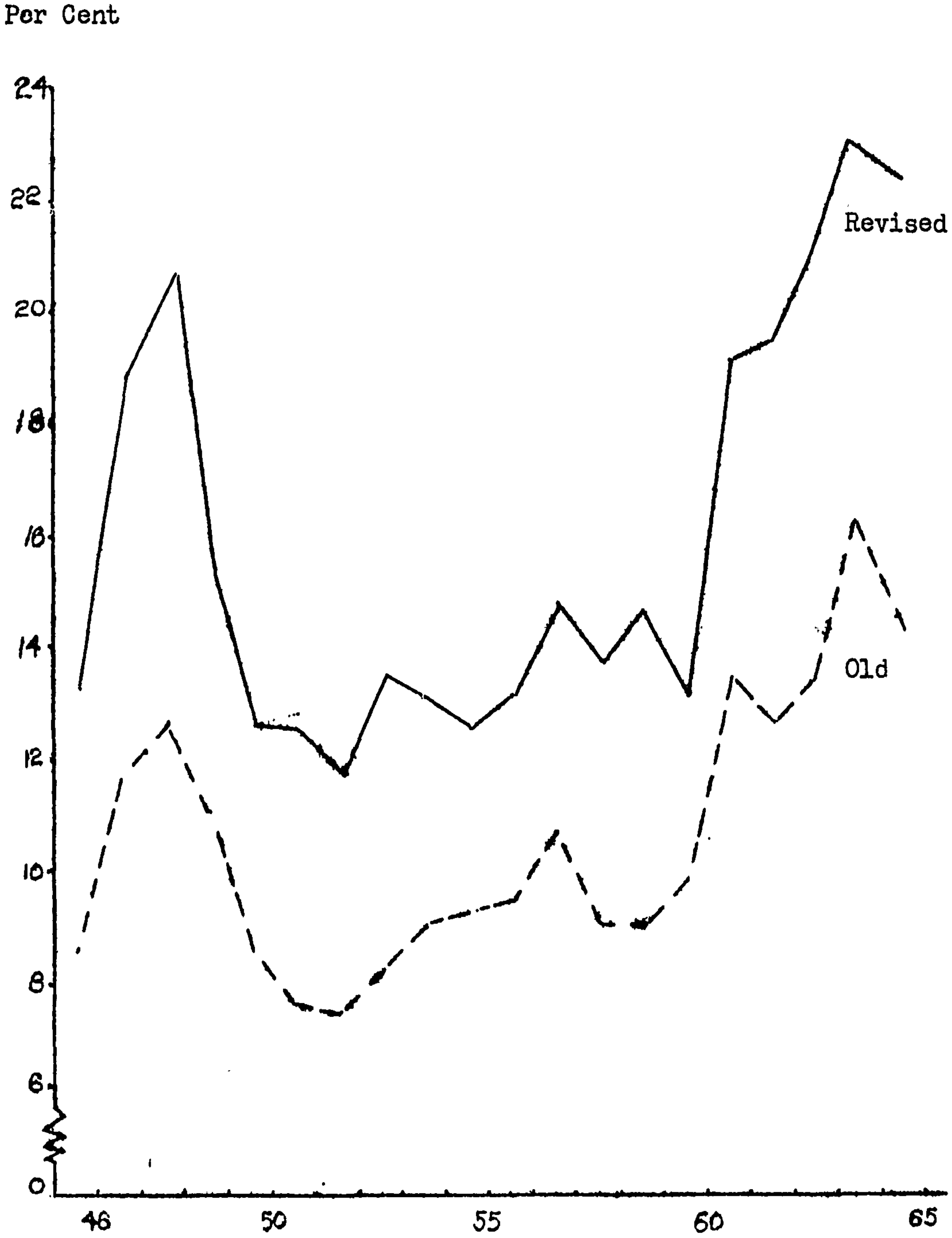


Figure 5
OLD AND REVISED ESTIMATES OF GROSS DOMESTIC CAPITAL FORMATION
AT CURRENT PRICES AS A PERCENTAGE OF GNP
AT CURRENT PRICES, 1946-65

252

data, and the rate of investment, as calculated from the old national accounts data. (The rate of investment is defined in both cases as gross domestic capital formation at current prices expressed as a percentage of GNP at current market prices.) It can be seen that the revised series is consistently greater than the old series. This phenomenon obviously reflects the substantial differences between the revised and old estimates of investment at current prices and the relatively minor differences (for the most part) between the revised and the old estimates of GNP at current prices. It can also be seen, however, that there is a strong, positive statistical association between the two series. Their directions of movement correspond closely in both the short and long term. This association warrants quantitative measurement. Thus, for the period 1946-65 the linear regression of the revised estimate of the rate of investment (Y) on the old estimate of the rate of investment (X) is $Y = 0.550 + 1.453X$, and the coefficient of determination (r^2) takes the high value of 0.910.

IV. SHORTCOMINGS IN THE REVISED ACCOUNTS

Although the revised accounts incorporate some considerable improvements in sources and methods, they are by no means free of shortcomings. In this section of the paper we shall make an examination of some of them. The discussion will be limited to two categories of shortcoming which to some (extent overlap: those which are of particular importance and those which appear to be relatively easily corrected.

(a) Net Domestic Product at Current Factor Cost

Net domestic product (from which is obtained the "value added" estimate of GNP) is found as the sum of the estimates of net value added for each industrial sector. As in the old accounts, most of these latter estimates suffer from the deficiency that, apart from certain benchmark years, they are derived by extrapolation or projection of the benchmark estimates according to the behavior of various indicators.[7] Admittedly, new and more numerous benchmark estimates have been employed, but the shortcomings inevitably inherent in this general approach remain.

In some sectors, such as agriculture, mining and quarrying, and construction, the extrapolating indicator is the gross value of production. It is assumed that net value added is a constant proportion of this gross production figure, a proportion which is equal to that which was actually observed directly in some benchmark year. In other words, net value added is assumed to have moved proportionately with the gross value of production. The shortcomings of this approach, particularly with respect to measuring short-run changes in value added, have been outlined elsewhere [5, pp. 138-39].

An alternative extrapolation technique is employed for a number of service sectors, the whole of the manufacturing sector prior to 1956, and "unorganized" manufacturing from 1956. For each of these sectors, sectoral value added is estimated by extrapolating a benchmark estimate in accordance with movements in wages or earnings and total employment in the sector. Subject to variations in the ratio of hired employees to total employment, this technique is equivalent to assuming that total value added moves proportionately with total payrolls or, in other words, that wages and salaries are a constant proportion of total value added or net domestic factor income. There do no appear to be any grounds for this assumption.

---

[7] The principal exceptions are "organized" manufacturing after 1955 and government services.

(b) Net Domestic Product at 1955 Factor Cost

The means of estimating real value added by sector are generally methodologically unsatisfactory. They involve either the extrapolation of base year value added according to the movement in some single "real" indicator or, alternatively, the deflation of money value added by a single price index, with no attempt to deflate separately the value of gross output and the value of sectoral purchases of intermediate goods and services. Perhaps the most striking deficiency concerns those sectors, such as "unorganized" manufacturing, transportation, communication, storage and utilities, and wholesale and retail trade, where real value added for nonbase years is estimated by extrapolating the base-year estimate according to movements in the volume of employment or, more precisely, by multiplying base-year value added per worker by the volume of employment in the appropriate nonbase year. Such a procedure implicitly assumes that there were no changes in labor productivity in these sectors. If on the contrary, as seems probable, there has been some increase in labor productivity in these sectors over the postwar period, the above procedure would have caused, ceteris paribus, some understatement of the rate of growth of real output for the economy as a whole.

(o) Final Expenditures on Goods and Services

As has been noted, the introduction of an independent estimate of personal consumption expenditure has enabled two estimates of GNP at current prices and two estimates of GNP at 1955 prices to be made. In each case OSCAS has preferred to rely on the estimate made by the value-added approach, with the result that the statistical discrepancy between this estimate and the one made from the side of final expenditures has been carried on the expenditure side of the national production account.

In the case of the current price data the discrepancy is mainly negative,[8] ranging from - 14.4 per cent of GNP, as estimated by the value-added approach, in 1946, to + 4.7 per cent in 1949. The average of the percentage discrepancies (regardless of sign) for the years 1946-67 is 5.4 per cent. In the case of the constant price data the discrepancy is again mainly negative with a range of - 5.2 per cent in 1948 to + 4.9 per cent in 1967. The average discrepancy (regardless of sign) is 3.3 per cent.

Discrepancies of this size must reduce considerably the usefulness of the national accounts, especially if their likely origins cannot be identified at least approximately. Although the official view appears to be that the discrepancy mainly reflects errors in the measurement of personal consumption expenditure (and, indeed, it is likely that there are inadequacies in the estimation of some items of consumption expenditure/especially expenditure on items other than food, beverages, and house rent), it has been seen that there also exists the possibility of significant errors in the "value-added" estimates of GNP. In addition, there are almost certainly errors in the other, nonconsumption items of final expenditure.

---

[8] I.e., the estimate of GNP made by the value-added technique falls short of the sum of the estimates of final expenditure on GNP.

With regard to the last point, it is generally accepted that the official data on merchandise foreign trade are subject to considerable inaccuracy, mainly because of widespread smuggling in both traditional and technical forms. Although particularly prior to decontrol there was outward as well as inward smuggling, it seems likely that for the most part the official data have overestimated balance of trade surpluses and underestimated balance of trade deficits. Consequently, it is probable that the use of such data in compiling the revised national-accounts estimates of total exports and imports of goods and services in both current and constant prices has led or would have led, other things being equal, to overestimates of total expenditure on GNP at both current and constant prices. (In this regard it is of interest to recall that in most years the statistical discrepancies for both current and constant price data are negative, i.e., the estimates of total expenditure on GNP exceed the value-added estimates of GNP.[9]

Another shortcoming in the foreign trade data of the revised national accounts stems from the methods of deflating the current price data in order to obtain constant price estimates of exports and imports of goods and services. The deflator used for exports was the wholesale price index of export products, while that used for imports was the wholesale price index of imported products. Although these indices probably tended to move in the same direction as the peso f.o.b. prices of merchandise exports and imports, which are the prices that are relevant to the valuation of the bulk of the foreign trade recorded in the national accounts, there is still likely to have been some significant discrepancies, particularly in the case of imports. The latter discrepancies would have resulted, inter alia, from changes in tariffs and special import charges and, most importantly, from the presence of the quantitative import restrictions which operated throughout the fifties. These restrictions caused shortages of many imported commodities, which resulted in their domestic wholesale prices rising independently of their f.o.b. peso costs. Moreover, with the subsequent devaluation of the peso (and abandonment of import controls), the associated higher f.o.b. peso prices of imports were in many instances not reflected proportionately in higher wholesale prices of imported products. Rather, the impact of the rise in the former prices was partially absorbed by the elimination of the scarcity profits hitherto received by importers on those imports which were permitted under the import control regulations [9, pp. 121-22].

---

[9] In 1964 Levy [5, p. 145] suggested that the official figures for merchandise trade be adjusted for errors in the light of the foreign trade figures of the Philippines' trading partners. Although the feasibility of this suggestion was subsequently established by Hicks [3], it has not been followed by the OSCAS in preparing the revised national accounts.

Accordingly, it would have been more appropriate to use indices of f.o.b. peso prices as deflators for the current price foreign trade data. These are apparently not directly available. However, for deflating exports it would have been possible to use a composite index formed from the Central Bank of the Philippines index of f.o.b. U.S. dollar unit values of exports and from an index of the average prevailing peso/U.S. dollar exchange rate for export proceeds. Similarly, for deflating imports it would have been possible to use a composite index formed from the Central Bank's index of c.i.f. U.S. dollar unit values of imports and from an index of the average prevailing exchange rate for outlays on imports. Admittedly, a c.i.f. unit value index might not have been as suitable as a f.o.b. one, but in view of the above discussion, this procedure would still have been preferable to that which has actually been followed.[10]

(d) Distribution of National Income

As pointed out above, the decision to drop the separate estimates of employee compensation and entrepreneurial and property income of persons from the revised breakdown of national income at current prices according to the various categories of factor income was entirely justified, given that such estimates (if they had appeared) would have been derived by the same type of methods as were employed in the old national accounts. Indeed, the estimates of private corporate income should also have been omitted from the revised accounts, since they too were derived by an inadequate method, one which is in fact identical to that employed in the old national accounts. This method entails estimating corporate income as the sum of corporate tax and undistributed corporate profits. Although the estimates of the former item may be quite accurate, the latter is crudely derived as an unvarying 74 per cent of corporate income after tax.

---

[10] Some comparisons between the revised national-accounts estimates of imports at 1955 prices and rough estimates of the same aggregate obtained with the use of the above procedure show considerable differences. For example, for the decade 1955-65 the real volume of all recorded imports of goods and services increased by 73.8 per cent according to the revised accounts, compared with an increase of only 19.9 per cent, as estimated using the above procedure. With regard to the real volume of recorded merchandise imports only, the revised national accounts method of deflation results in an estimated increase of 68.5 per cent between 1955 and 1965, whereas the above procedure results in an estimated increase of 16.2 per cent. The likelihood that the latter figure is the more accurate of the two in this comrison is suggested by the fact that the Central Bank of the Philippines' quantum index of merchandise imports increased by only 17.1 per cent between 1955 and 1965.

Nevertheless, while conceding the inadequacy of the old methods of estimation, it must also be admitted that the absence of reliable annual data on factor-income shares forms a serious gap in the revised national accounts, a gap which should be filled as soon as possible. Previous writers have suggested that, as a starting point or "basic core", annual estimates of total wages and salaries could be compiled directly from data collected by the Social Security System, the Bureau of Internal Revenue and the Philippine Statistical Survey of Households (PSSH) [2, p. 87], [5, p. 143]. A second, alternative approach is tentatively suggested here. It treats national income as being composed of three analytically important categories: agricultural income, nonagricultural wages and salaries, and nonagricultural entrepreneurial and property income. The first of these categories is equivalent (subject to an adjustment for net factor income paid abroad) to net domestic product originating in agriculture. The second could be estimated for any year by extrapolating a benchmark estimate of total nonagricultural wages and salaries, taken perhaps from the National Economic Council's 1961 Input-Output Table or the PSSH's 1961 Survey of Family Income and Expenditures (with an adjustment for those wage earners not living in families). The extrapolation could be made using the Central Bank's indices of average monthly earnings of wage earners and salaried employees in selected nonagricultural industries and data on nonagricultural employment of hired labor which are or could be obtained by the PSSH. Nonagricultural entrepreneurial and property income could then be found as the residual difference between total national income (estimated by the value-added approach) and the sum of other two types of factor income.

Of course, for the approach to be a meaningful one, it would be necessary to devise a different method of estimating net value added for non-benchmark years in those nonagricultural sectors where it is presently derived by extrapolating benchmark estimates in accordance with movements in wages or earnings and employment in those sectors. Otherwise, there could be some automatic tendency for the estimated relative share of total wages and salaries in nonagricultural national income to remain constant.[11]

(e) Public and Private Investment

We have already noted the inadequacies of the old estimates of the division of total capital formation between public and private investment and the inadequacies of the old estimates of fixed capital formation for each industrial sector. We have also supported their subsequent omissions from the revised national accounts, given the old techniques of estimation. However, as with the omission of certain distribution data, these omissions leave gaps which should be filled by more accurate estimates. At least in the case of the division of investment into its public and private components (estimates of which are necessary in a variety of fields of policy-making and analysis including those concerned with the stabilization of the level of economic activity and with economic growth), the task of providing such estimates should not prove too difficult or costly.

---

[11] See p. 14 above.

The OSCAS already collects direct information on public investment in construction; data on other physical capital expenditures made by the national government, local governments, and government corporations should be available in one form or another in the accounts of these entities, although its isolation may involve some further cooperation from the relevent authorities. It should thus be possible to obtain direct estimates of total public investment.[12] Private investment could then be found by subtracting public investment from the independent estimate of total gross domestic capital formation. This suggested procedure is the same as that employed in the old national accounts, with the major exception that non-construction public investment would be treated not as part of the residual estimate of private investment but rather would be estimated directly and grouped correctly with public construction expenditure.

V. CONCLUDING SUMMARY

In this paper three tasks have been undertaken. First, we have examined the more important changes in estimating procedures associated with the revised Philippine national accounts. These include the substitution of a direct estimate of personal consumption expenditure for the old residual estimate, the use of new data sources in estimating GNP by the value-added approach, changes in the methods of measuring gross domestic capital formation and valuing foreign transactions, and the abandonment (without replacement) or some of the old techniques used in the estimation of factor-income distribution and investment composition.

---

[12] It should be noted that on p. 15 of Amelia B. Abello's paper [1] estimates of public capital expenditure for fiscal years 1955-60 were provided. The sources of these estimates are Budget Commission, *Budget*, FY 1957-1960 and General Auditing Office. *Report of the Auditor General to the President and the Congress of the Philippines on the Local Government*, FY 1957-1962. However, it should also be noted that, on the one hand, the estimates exclude physical investment by government corporations and, on the other hand, include public loans to these corporations and government subscriptions to their capital stocks. The latter items are, of course, by no means necessarily equivalent to physical capital formation.

Secondly an assessment has been made of the quantitative importance of some of the data revisions which resulted from the changes in sources and methods. Specifically, the revised estimates of three important aggregates - GNP at current prices, GNP at 1955 prices, and gross domestic capital formation at current prices - and the revised estimates of the rate of gross investment at current prices have been compared with the corresponding old estimates.

Finally, a number of shortcomings in the estimation of the revised accounts have been considered. These relate to the methods of deriving net domestic product at current and 1955 factor cost, the estimates of some of the components of final expenditure on GNP, the absence of sufficient, reliable information on factor-income distribution, and the absence of sufficient, reliable information on the composition of investment. It appears that some (though not all) of these shortcomings can be overcome relatively easily, and to this end various suggestions have been advanced.

REFERENCES

(1) A. B. Abello, "Patterns of Philippine Public Expenditure and Revenue, 1951-60." Quezon City: University of the Philippines, 1964.

(2) C. L. Barber. "National Income Estimates in the Philippines," Philippine Economic Journal, Vol. IV, No. 1 (First Semester 1965), 64-96.

(3) G. L. Hicks. "Philippine Foreign Trade, 195-65: Basic Data and Major Characteristics." Washington: National Planning Association, 1966. (Mimeographed.)

(4) E. Levy. Review of Economic Statistics in the Philippines, Interim Report. Manila: World Bank Resident Mission. May 1964. (Mimeographed.)

(5) _______. "The Usefulness of Existing National Accounts for the Analysis of the Philippine Economy," Philippine Economic Journal, Vol. V, No. 1 (First Semesterm 1966), 134-45.

(6) National Economic Council, "National Accounts of the Philippines, CY 1946-67," Statistical Reporter Vol. XIII, No. 1 (January-March 1969). [Preliminary versions of the revised data for 1962-67 appear in Vol. XI, No. 2 (April-June 1967) and Vol. XII, No. 2 (April-June 1968) of the Statistical Reporter; the old OSCAS national accounts, which cover the period 1946-65, are found in Vols. III-X (1959-66), second numbers of each volume, of the same publication.]

(7) _______, Statistical Reporter, Vol. VII, No. 2 (April-June 1963).

(8) G. P. Sicat. "On the Accuracy of Philippine National Income Accounts," Philippine Review of Business and Economics, Vol. I, No. 2 (October 1964).

(9) M. Treadgold and R. W. Hooley. "Decontrol and the Redirection of Income Flows: A Second Look," Philippine Economic Journal, Vol. VI, No. 2 (Second Semester 1967).

(10) R. F. Trinidad. "A Measure of the Nation's Output at Constant Prices," Statistical Reporter, Vol. III, No. 2 (April 1959).

(11) United Nations, Economic Survey of Asia and the Far East, 1961.

(12) J. C. Warren. "Energy and Economic Advance," Philippine Economic Journal, Vol. III, No. 1 (First Semester 1964).

March 25, 1971

Income Accounts 71-3

MEMORANDUM for -

THE CHAIRMAN

SUBJECT: Government Capital Formation in Durable Equipment

The following are some preliminary notes on government capital formation in durable equipment:

1. Government capital formation, as reflected in the national income accounts refers only to government construction ("other construction") and does not specify government investment in durable equipment. Hence, government data are understated and private investment figures are overstated by the amount of government outlays for durable equipment.

In a study undertaken by Mr. Peregrino Reyes, it was found that 2.7 per cent of the total capital formation in durable equipment is accounted for by the government. This is shown in the table below:

GOVERNMENT CAPITAL FORMATION IN DURABLE EQUIPMENT
1962-68

Fiscal Year	Amount, Thousand Pesos	As Per Cent of Capital Formation in Durable Equipment
1962	35,895	2.3
1963	58,738	3.3
1964	73,343	3.2
1965	61,882	2.7
1966	59,005	2.2
1967	81,821	2.4
1968	93,170	2.5
Average for 1962-68 - - - - - - - - - - - - - -		2.7

Source: OSCAS, NEC.

These magnitudes may appear small at first glance, but they may be enough to introduce biases into the analysis of private and government investment. For example, one deriving two investment functions - one for the private sector and another for the public sector - may obtain unrealistic results. In view of this, the presentation and estimation of government capital formation should be re-examined.

2. Presentation. The table on "Gross Domestic Capital Formation by Type of Capital Goods" may be modified as follows:

Type of Capital Goods

A. Fixed Capital Formation

- 1. Construction
    - a. Dwellings
    - b. Non-residential buildings
    - c. Other construction
        - (1) Government
        - (2) Private, if any
- 2. Durable Equipment
    - a. Transport
        - (1) Private
        - (2) Government
    - b. Machinery and other equipment
        - (1) Private
        - (2) Government

B. Increase in Stocks

Total: GROSS DOMESTIC CAPITAL FORMATION

An alternative is to provide a supplementary table showing the breakdown of investment in construction and durable equipment into the private and public sectors.

3. Estimation. Data for government investment in durable equipment can be obtained from the Annual Reports of the Auditor General. After converting the figures from fiscal year to calendar year basis, these must be subracted from total capital formation in durable equipment to obtain private outlays on durable equipment. Not much problem is expected in this part of the computations. The main problem is in taking account of acquisitions of durable equipment not indicated in the GAO reports, such as equipment acquired via reparations or by the military. In the latter case, a large amount of equipment intended for civilian purposes has been acquired, especially in recent years. These must be included in the estimate of government capital formation.

FILOLOGO PANTE, JR.

11.4

May 7, 1971

Income Accounts 71-7

Memorandum For: The Chairman

Subject: Estimates of the Gross Value and Value-Added in Construction

1. Attached are the estimates of the gross value and value-added in construction activity for the period 1956-69 based on the commodity - flow approach. In general, the procedure consists in estimating the value of construction materials consumed by adjusting the domestic production of these materials for imports and exports. The value of non-material costs is then to obtain the gross value of construction. Account is subsequently taken of farm construction and expenditures for land development. A value added ratio is used to derive value-added in construction.

2. Table 1 presents the estimates of gross value in construction for the period and compares these with the old and revised NEC estimates. The relevant growth rates are also shown. The three estimates are presented graphically in Figure 1. Table 2 and Figure 2 are the data and graphs for value-added in construction. The discrepancies in per cent between the NEC revised estimates and the commodity-flow estimates are shown in Table 3.

3. Private construction can be obtained by deducting government construction from the gross value of construction. (See Table 4.) The ratio of the value of permit valuation in Manila and 24 cities to total private construction is then compared with the ratios currently being used to allocate the gross value of construction between construction in Manila and 24 cities and construction for the rest of the Philippines. (See Table 5.)

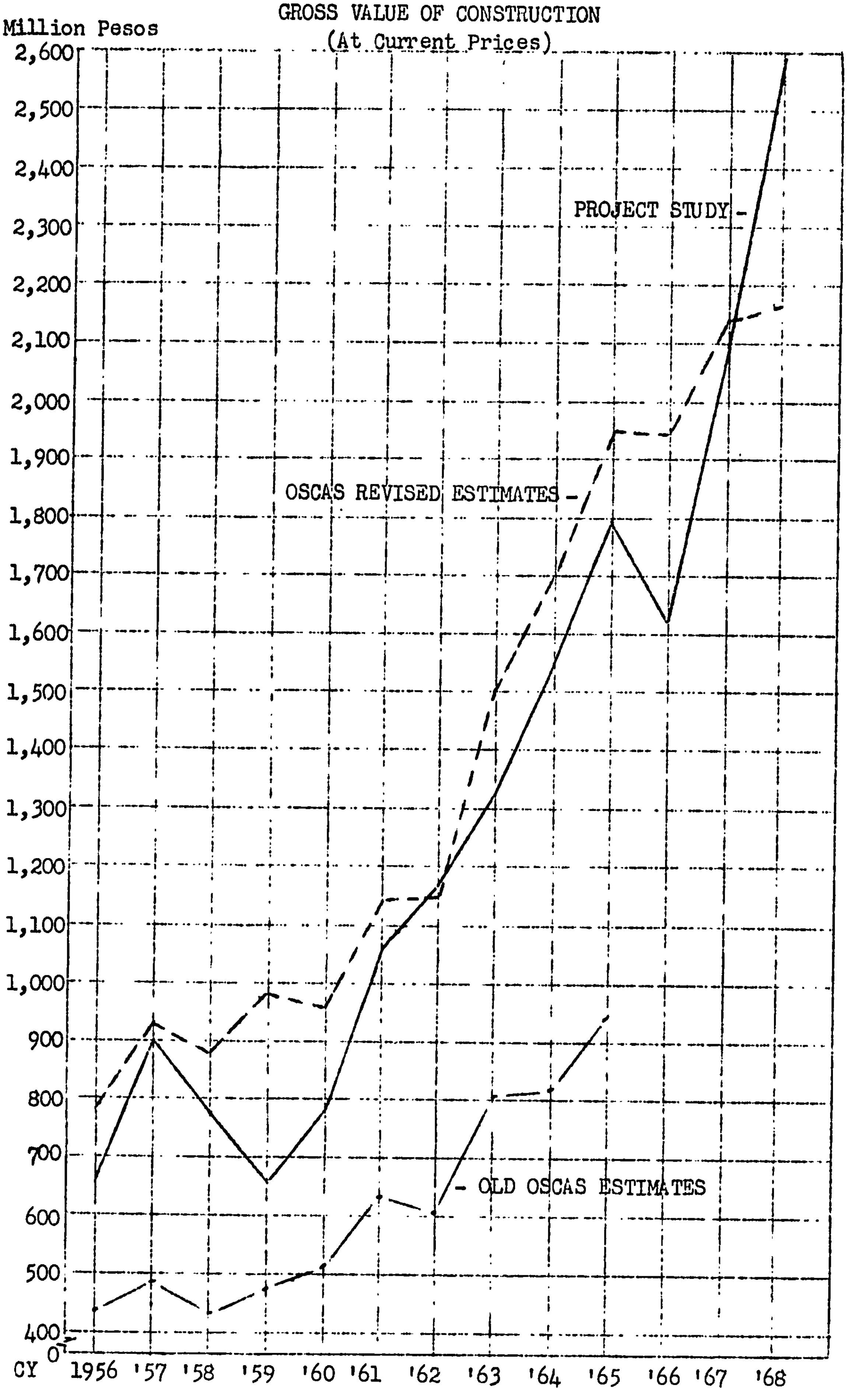
4. Various relationships between permit valuation in Manila and 24 cities and total private construction (and possibly the production of specific construction materials) will further be tested by regression analysis.

FILOLOGO PANTE, JR.

TABLE I
GROSS VALUE OF CONSTRUCTION
(Values in Million Pesos at Current Prices)

CY	Project Study	Growth Rate%	OSCAS Revised Estimates	Growth Rate%	OSCAS Old Estimates	Growth Rate%
1956	655		782		435	
1957	898	37.1	928	18.7	484	11.3
1958	778	-13.4	873	-5.9	438	-9.5
1959	658	-15.4	983	12.6	479	9.4
1960	974	48.0	954	-3.0	505	5.4
1961	1,058	8.6	1,144	19.9	635	27.7
1962	1,160	9.6	1,150	0.5	610	-3.9
1963	1,325	14.2	1,497	30.2	801	31.3
1964	1,536	15.9	1,695	13.2	814	1.6
1965	1,799	17.1	1,946	14.8	939	15.3
1966	1,608	-10.6	1,945	-0.05		
1967	2,098	30.5	2,133	9.7		
1968	2,587	23.3	2,164	1.5		

Figure 1


GROSS VALUE OF CONSTRUCTION
(At Current Prices)
Million Pesos
2,600
2,500
2,400
2,300
2,200
2,100
2,000
1,900
1,800
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
0
CY
1956
'57
'58
'59
'60
'61
'62
'63
'64
'65
'66
'67
'68
PROJECT STUDY
OSCAS REVISED ESTIMATES
OLD OSCAS ESTIMATES

270

TABLE 2

VALUE ADDED IN CONSTRUCTION

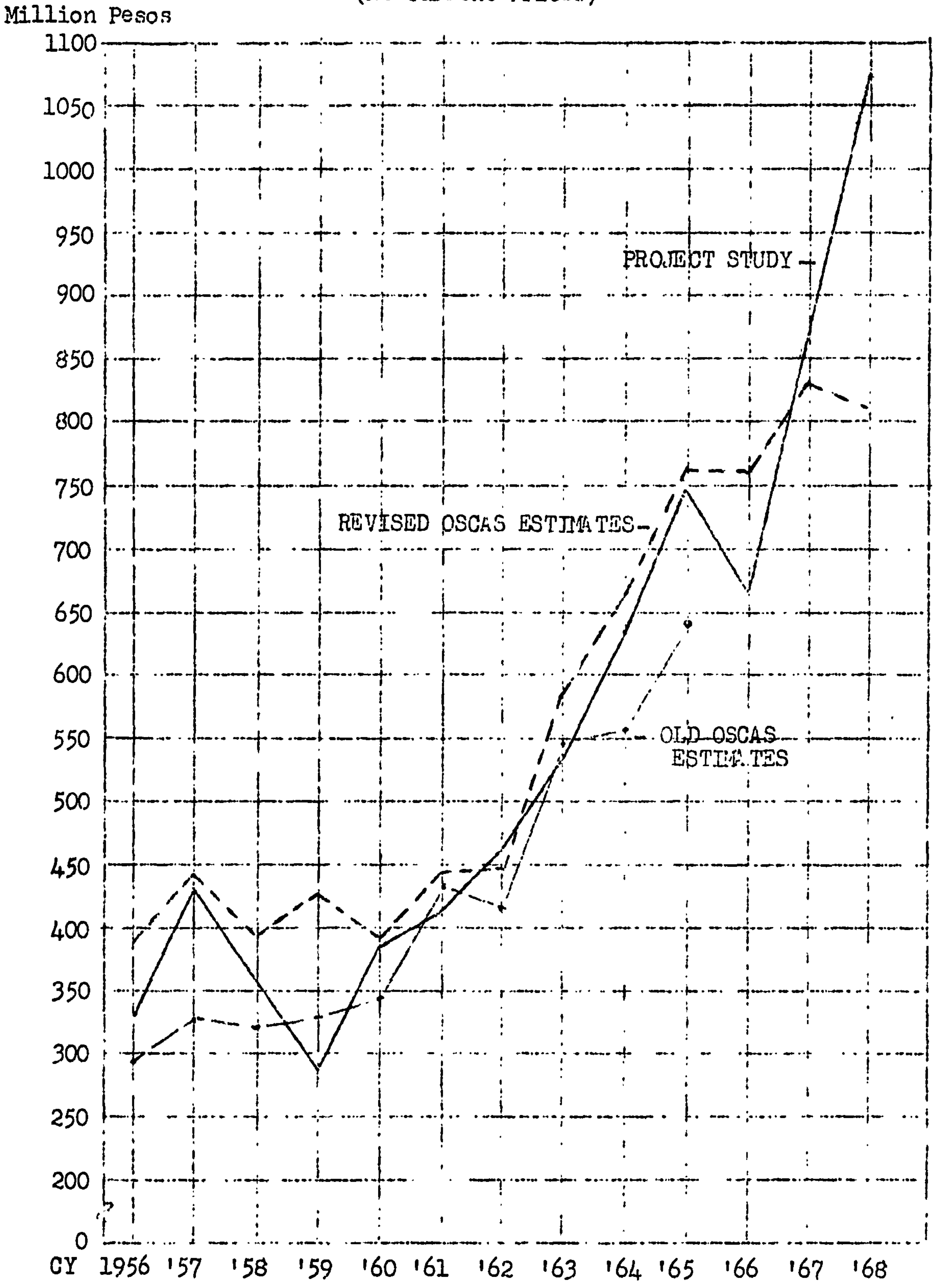
(Values in Million Pesos at Current Prices)

CY	Project Study	Growth Rate%	OSCAS Revised Estimates	Growth Rate%	OSCAS Old Estimates	Growth Rate%
1956	329		392		296	
1957	431	31.0	445	13.5	329	11.1
1958	356	-17.4	399	-10.3	298	-9.4
1959	286	-19.7	428	7.3	326	9.4
1960	387	35.3	394	-7.9	344	5.5
1961	413	6.7	446	13.2	432	25.6
1962	460	11.4	448	0.4	415	3.9
1963	533	15.9	584	30.4	545	31.3
1964	628	17.8	661	13.2	554	1.7
1965	747	18.9	759	14.8	639	15.3
1966	667	-10.7	759	0		
1967	870	30.4	832	9.6		
1968	1,074	23.4	811	-2.5		

Figure 2

VALUE-ADDED IN CONSTRUCTION

(At Current Prices)



October 29, 1968

MEMORANDUM

TO : Mr. Bernardino G. Bantegui
Director, Office of Statistical
Coordination and Standards
National Economic Council

FROM: Robert C. Turner
Visiting Professor of Economics
University of the Philippines

The following is in response to your request for a brief restatement of the comments I made to you orally on the structure and format of the Philippine national accounts.

Permit me to emphasize two points. First, I am impressed with the progress that OSCAS has made in developing a useful set of national accounts, especially considering the paucity of primary data from other agencies of government and from the private sector. My purpose in making these comments is not intended in anyway as a criticism of present accounting practice. Rather, it is intended to be helpful. I hope that I can make some suggestions which will assist OSCAS to provide even more useful data for national economic policy making.

Second, my comments are limited to the structure and format of the accounts, including certain definitional matters. That is, I shall not attempt to discuss estimating procedures, which would require a knowledge of availability of statistical sources far beyond mine. In any country's national accounts system, estimating procedures are less than perfect and in a never-ending process of improvement. Further, any country's national accountants must of necessity rely upon primary statistical data collected by other agencies of government for other purposes, which means that improvement in estimating procedures must extend to all of these agencies plus, in some instances, organizations in the private sector. Such improvement is therefore a large undertaking, requiring close coordination of government agencies. Such a large-scale, coordinated effort in the Philippines would be valuable indeed, but it is beyond my capacities.

The national accounts are the most important set of statistics produced by the government. They provide the basic data for national economic planning, and without a reasonably good set of figures, rational planning is severely handicapped if not impossible. The accounts also provide valuable information to private business. And they are of interest to historians who simply want to explain the past. But, the national policy-making role of the accounts is primary, and the design and formulation of the accounts should be pointed to this use.

The essence of national economic policy making involves the following steps: (1) Identification of the goals of national economic policy for the next year or several years; (2) An analysis of the recent past, to identify where the economy currently stands, in relation to those goals, and why; (3) A forecast of the near-term future assuming certain economic policies, usually that present economic policies continue without change; (4) if this forecast indicates that economic performance will probably not correspond to the goals, identification of the changes in economic policy that will facilitate, and hopefully assure, achievement of the goals; (5) If it is concluded that achievement of previously stated goals is impractical and unrealistic, it may be desirable to revise those goals.

The implications of this planning process to national income accountants are several. (1) The accounts, of course, should be as accurate as possible. (2) They should be as up-to-date as possible. (3) They should be structured so as to reveal clearly the particular figures and relationships in the accounts needed for policy making and implementation. In the Philippines, in which general economic influence by government is exercised chiefly via (a) fiscal and monetary policies, and (b) the spending and lending activities of government financial institutions,[1] it follows that the accounts should be designed to yield figures needed to formulate appropriate fiscal and monetary policies and appropriate actions by government financial institutions. (4) They should be structured so as to provide, to the extent feasible, the information needed for economic forecasting.

Contemporary economic forecasting takes the form of macro-economic model building, that is, estimating Gross National Expenditure and Gross National Income for the forecast period. Primary emphasis is placed on the estimate of Gross National Expenditure, on the assumption that, in a free economy, spending by economic units (households, corporations, unincorporated enterprises, governments, foreigners) provides the initiating stimulus to productive activity. At the same time, spending, to a greater or lesser degree, is influenced or limited by income. For this reason, it is essential in forecasting to look at the reverse causation, that is, to trace out the income effects of productive activity. Ideally, the components of GNE and GNI should be completely interrelated for effective forecasting.

---

[1] The reference is to government influence on the general level of economic activity, the rate of economic growth, etc. More specific controls, of course, are exercised in various product areas, e.g. the rice price support program, tariffs, quotas on imports of certain commodities, etc.

More precisely, macroeconomic forecasting assumes that total spending by the national government, by private business for fixed investment purposes, and by foreigners (Philippine exports) are, in the short run, quasi-autonomous in character, and are the principal determinants of variations in aggregate demand. Each of these three types of spending, however, has its own set of unique determinants. For this reason, it is important that the three types of spending and their major components be separately identifiable in the national accounts.

Consumption expenditures, on the other hand, are assumed to be primarily a function of disposable personal income, which means that the accounts should reveal the magnitudes that determine disposable personal income. These, in addition to aggregate spending (GNE) generally, are primarily tax collections of several kinds by government, transfer payments, and the distribution of corporate profits to dividends, taxes, and corporate saving. Accurate figures on these variables are therefore essential to analysis.

Further, although consumption expenditures are a function of disposable personal income, the functional relationship is not constant or invariable. For this reason, information on the magnitude and determinants of personal saving (i.e. non-consumption use of income) is essential.

With this general background, let me turn now to some of the specific features of the national accounts of the Philippines as currently published, and suggest a few changes which might be made to render the accounts more useful for policy formulations purposes.

Treatment of the Statistical Discrepancy

In the present accounts, the statistical discrepancy is included in the personal income and outlay account. I understand that the reason for including it in this account is the assumption that the most serious single source of error in the accounts is probably in the estimation of personal consumption expenditures. This assumption may well be correct, though estimating errors are inevitably involved in other entries. Even if this assumption is correct, however, inclusion of the discrepancy in the personal account is inconsistent with the logic of the accounting system. The statistical discrepancy is the net error resulting from errors in estimate in all of the accounts. It is for this reason that there is a final "reconciliation" account in any national income accounting system, which reveals the lack of equality in the accounts and calls for an entry to balance the accounts.

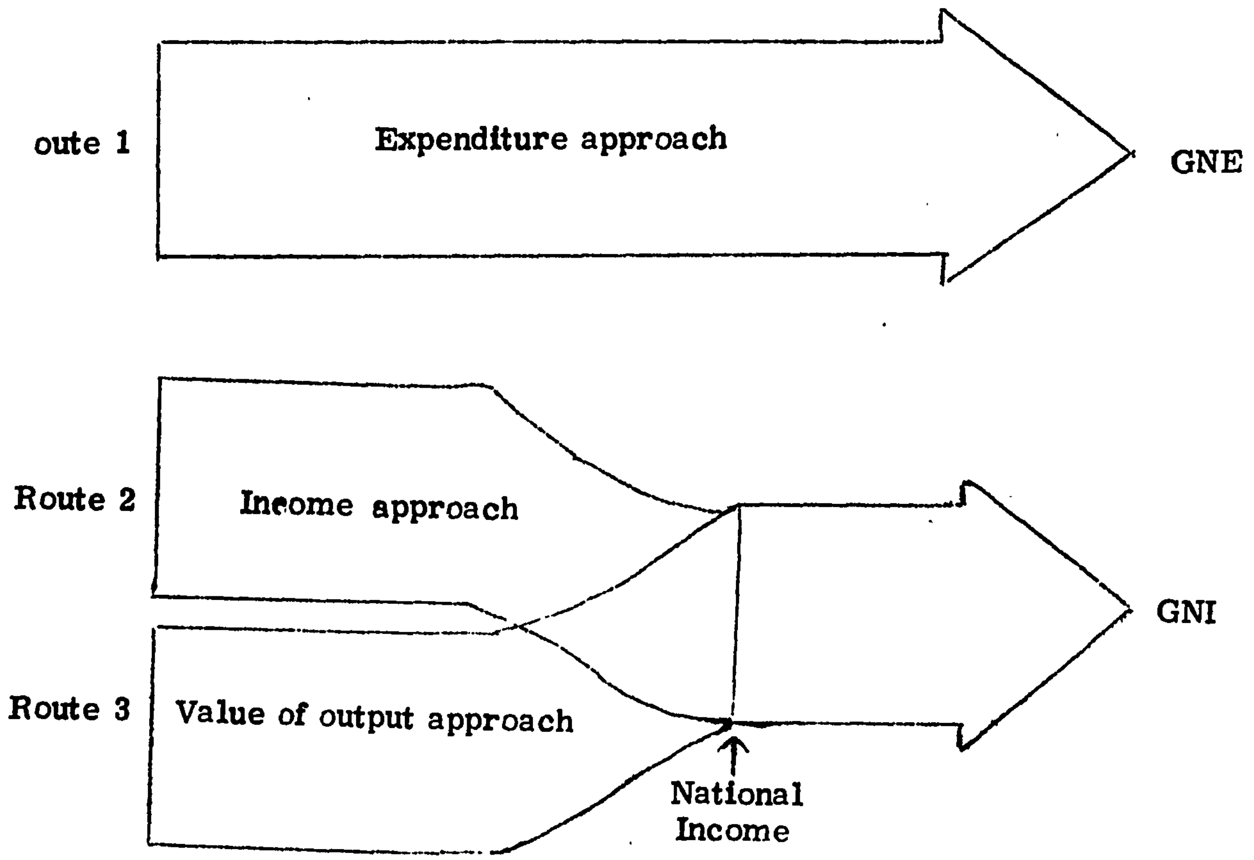
At the risk of belaboring the obvious, perhaps a restatement of the logical theory of a national income accounting system will clarify my point. In any economy, because every outlay of money income by a person is a receipt to someone else (i.e. because there are two sides to every counter), the sum of all outlays for the economy as a whole must be exact equal to the sum of all receipts, that is, gross national expenditures (GNE) is by definition equal to gross national income (GNI). So national income accountants use two approaches to measure (estimate) the output of the economy. One is a metering of expenditures at market prices, covering final expenditures only to avoid double counting. The second is a metering of receipts, i.e. income as such (the earnings of the factors of production, or "national income") plus certain items which are reflected in market prices but are not "income" to the factors of production, e.g. capital consumption allowances and indirect business taxes. These two approaches theoretically should, but in the real statistical world do not, yield exactly the same total. The difference is the Statistical Discrepancy.

The second, the income, approach is paralleled by a third approach, metering the value of output (value added) by industry. This approach yields another estimate of the sub-total "national income" or "net national product at factor cost." There could well also be a statistical discrepancy between the sub-total, "national income," derived from the value added approach and the same sub-total derived from the income approach. If there were, we would wind up with three statistical discrepancies (1-2, 1-3, and 2-3), which would be an unconscionable nuisance. To avoid this problem, national income accountants universally force the National Income figures derived from the two approaches (income and value added) to be equal.[1]

The following "arrow" diagram illustrates the three approaches:

---

[1] Perhaps it would be more accurate to say that statisticians estimate the two sets of figures simultaneously, cross-referencing them at various levels and often using data from one approach to fill a "hole" in the data using the other approach, thus automatically coming up with a single total.



In the summary statements of the accounts usually published, only Routes 1 and 2 are shown all the way to GNI and GNE (which equal GNP). Route 1 if it were fully described would be called "Gross National Product as measured by Gross National Expenditure," but this overly-long title is abbreviated in the U.S. to "Gross National Product or Expenditure," and in the Philippines to "Expenditures on Gross National Product" -- more descriptive title than the U.S. title.

Route 2, if fully labeled, would be "Gross National Product as measured by Gross National Income." It is usually abbreviated to "Charges against Gross National Product," or in the Philippines to "Gross National Product at Market Prices," -- a not entirely logical title because the "market prices" reference is to the expenditure approach, not the income approach. A possible improvement on both titles, which would parallel the "Expenditures on GNP" title used in the Philippine accounts, would be "Receipts from Gross National Product."

Route 3 is carried only to the sub-total, National Income (by industrial origin). It is not included in the summary "Income and Product Account" table.

The summary, "Income and Product Account" table arrays the figures derived from the two approaches, including taxes and transfers, into four sectors; persons, governments, foreigners, and business, and shows the receipts and expenditures of each, as follows:

Persons

Expenditures		Receipts	
Consumption expenditures	xxx	Wages and salaries	xxx
Personal taxes	xxx	Proprietors income	xxx
Etc.	xxx	Etc.	xxx
Transfers by persons	xxx	Transfers to persons	xxx
Total expenditures	xxx	Total	xxx
Personal Saving (+)	xxx		
Total	xxx		

The totals for the sector are equal, personal saving being the residual, or balancing item.

Government

Expenditures		Receipts	
Purchases of goods and services	xxx	Personal (direct) taxes	xxx
Various transfer payments	xxx	Indirect taxes	xxx
		Other taxes	xxx
Total	xxx		
		Total	xxx
Government surplus (+) or deficit (-)	xxx		
Total	xxx		

Again the totals for the sector are equal, the surplus or deficit being the residual, or balancing item.

Foreigners

Expenditures		Receipts	
Exports	xxx	Imports	xxx
Total	xxx	Transfers from persons and governments	xxx
		Total receipts	xxx
		Net foreign investment (+)	xxx
		Total	xxx

Because the receipts and expenditures are arranged from the point of view of the sector, in this case foreigners, Philippine exports are an expenditure, and Philippine imports are a receipt. Net foreign investment is the residual, or balancing item.

Business

Expenditures		Receipts	
Business investment	xxx	Capital consumption allowances	xxx
Total	xxx	Undistributed profits	xxx
		Etc.	xxx
		Total receipts	xxx
		Business surplus (+) or deficit (-)	xxx
		Total	xxx

The business surplus or deficit is the residual, or balancing item.

Finally, the balancing items from the four sector accounts can be arranged in a fifth account (not a "sector" account), as follows:

Reconciliation Account[1]

Net foreign investment	xxx	Personal saving (+)	xxx
Total	xxx	Govt. surplus (+) or deficit (-)	xxx
		Business surplus (-) or deficit (+)	xxx
		Total	xxx
		Statistical discrepancy	xxx
		Total	xxx

---

[1] In the reconciliation account, the debit entries in the sector accounts become credit entries and vice versa or, as in the case of the business surplus (normally negative). The credit entry is usually entered on the credit side but the sign is changed. Thus, the numbers are normally and conveniently all positive numbers.

The statistical discrepancy is now the residual, or balancing item, is the net amount needed to make total expenditures equal total receipts. or alternatively, to make the balancing entries from each sector account add to the same total. Conceptually, it could be entered on either side (with the necessary change in sign). It is usually entered on the income side, because the expenditure side figures are more widely used, and it is a convenience to the user not to have to warry about the discrepancy. In the Philippines, it is put on the expenditure side, presumably because it is felt that the income figures are better than the expenditure figures.

In their publications, many countries (including the U.S. since 1958) consolidate the "Business" account and the "Reconciliation" account into a single account (whereupon it ceases to be a purely sector account). When they are thusly consolidated, the "business deficit" appears on both sides of the consolidated account and therefore can be cancelled out, i.e. not shown on either side. They are consolidated in the Philippine accounts, into a "Combined Capital Reconciliation Account." There is nothing wrong with such a consolidation, of course, and there is one advantage: the saving (or dissaving) and investment items are then juxtaposed. Not consolidating the accounts, however, would have the advantage of making the logic of the system a bit more obvious.

Now back to our main point. Plugging the statistical discrepancy into the personal account implies that all the estimating error is in that account. Some, perhaps most, of the error may be there, but it is not all there. The only logical place for the discrepancy is in the reconciliation account. And the fact that the business and the reconciliation accounts have been consolidated should not conceal this logic. If the two accounts are consolidated, the statistical discrepancy logically belongs in the consolidated account, which would not necessarily mean that the discrepancy is attributed to the "Business" items in the consolidated account, but rather to the reconciliation items, i.e. to the grand totals only.

In practice, putting the discrepancy in the personal account distorts the calculation of the residual, personal saving. It may improve the personal saving estimate to the extent that the estimating error is in fact in personal consumption expenditures, but it worsens the personal saving estimate by charging all of the remaining estimating error against personal saving. The most defensible practice for OSCAS to follow, it seems to me, would be to adhere strictly to the logical principles to national accounting; put the discrepancy where it belongs, and let the estimates stand for what they are: the best estimates of each item in the accounts that can be made at this time.

Nations Economic Budget Format

As mentioned above, the tabulation of receipts and expenditures in the "National Income and Product Accounts," by sector, is before taxes and transfers. The four sectors (persons, governments, foreigners, and business) therefore contain duplicative entries and the sum of the totals for the four sectors is a meaningless total, greater than GNE or GNI. For economic analysis purposes, it is convenient to rearrange the data on an after taxes and transfers basis, thus eliminating the duplicative entries. The format for such a rearrangement is as follows:

	Persons		
Item	Receipts	Expenditures	Balance*
Personal Income	xxx		
Less: Taxes paid by persons	xxx		
Less: Transfers by persons	xxx		
Equals: Disposable personal income	xxx		
Less: Personal consumption expenditures		xxx	
Equals: Personal saving			xxx

	Government		
Item	Receipts	Expenditures	Balance*
Gross tax receipts	xxx		
Less: Transfers to persons	xxx		
Less: Transfers to business (subsidies)	xxx		
Less: Transfers to foreigners	xxx		

Item	Receipts	Expenditures	Balance
Equals: Net receipts	xxx		
Less: Purchases of goods and services			
Current		xxx	
Capital		xxx	
Total		xxx	
Equals: Surplus (+) or deficit (-)			xxx

Foreigners			
Item 1/	Receipts	Expenditures	Balance*
Transfers to foreigners by persons	xxx		
Transfers to foreigners by governments	xxx		
Equals: Net receipts	xxx		
Less: Net exports		xxx	
Equals: Net foreign investments 2/			xxx

Item[1]	Business Receipts	 Expenditures	 Balance*
Capital consumption Allowances	xxx		
Corporate saving (undistributed profits)	xxx		
Etc.	xxx		
Equals: Net retained earnings	xxx		
Less: Business investment		xxx	
Equals: Business surplus (+) or deficit (-)			xxx
Total of four sectors	GNI	GNE	
Statistical discrepancy		xxx	xxx
Total	GNP	GNP	0

---

*Receipts minus expenditures.

[1] Conceptually, there could be an entry "Transfers to foreigners by business." I know of no system of accounts, however, where such an item exists in practice.

[2] With sign changed.

Arranged in this fashion, the totals of the receipts, and expenditures columns do equal GNI and GNE. The "balance" column takes the place of the reconciliation account, and of course, adds to zero after entering the statistical discrepancy.

The "Nation's Economic Budget" format is a useful arrangement of the accounts for economic analysis purposes. Although it is relatively easy to work out by persons familiar with national income accounting, it would be helpful to users of the accounts if the N.E.C. did it for them and published the results.[2]

The following is a sample Nation's Economic Budget for the Philippines, using the data in the August 30, 1968 revision, and shifting the statistical discrepancy to the end of the accounts (which changes the figure for personal saving).

---

[2] In Economic Indicators, the statistical publication of the U.S. Council for Economic Advisers, the Nations' Economic Budget is prominently featured on page 1 of the document.

12.14

Philippine Nation's Economic Budget, 1967

	Receipts	Expenditures	Balance
PERSONS			
Personal income	21,001		
Less: Personal direct taxes	278		
Equals: Disposable personal income	20,723		
Personal consumption expenditures		19,802	
Personal saving			+ 921
BUSINESS			
Capital consumption allowances	2,160		
Corporate saving	570		
Gross retained earnings	2,730		
Gross domestic capital formation 1/		5,514	
Business deficit			- 2,784
GOVERNMENTS			
Current receipts	2,913		
Less: Transfers to persons	245		
Equals: Net receipts of governments	2,668		
General government consumption 1/		2,414	
Government surplus			+ 254
FOREIGNERS			
Transfers to foreigners 2/	- 696		
Net exports		- 710	
Net factor income from abroad		- 211	
Net foreign investment 3/			+ 225
Statistical discrepancy		-1,384	+1,384
Total (GNP)	25,425	25,425	0

Footnotes: Philippine Nation's Economic Budget, 1967

[1] Government capital formation should be included under government purchases of goods and services in the government sector. Available data, however, do not permit separating government from private capital formation. For this reason, government capital formation is included above in the Business sector and not in the Government sector.

[2] Current transfer payments from abroad with sign changed.

[3] Net borrowing from abroad in the Philippine accounts, with sign changed.

Treatment of Government Investment

In any national accounting system, the treatment of government investment poses a problem, and practice among countries varies. The problem arises from the fact that it is a *government* expenditure, and therefore logically should be included in the government sector account, but at the same time it is an *investment* expenditure, and putting it in the business (capital) sector account permits a ready calculation of total investment.

The treatment accorded government investment in the U.S. is illogical: no distinction whatsoever is made between governments' current consumption and capital investment. American economists have complained about this treatment for years.[1] The

---

[1] The explanation given by the U.S. national income accountants for failing to make a distinction between current and capital expenditures is that, because no distinction is made in the official budget documents, it is difficult (impossible) for statisticians (national income accountants) to make such a distinction.

Philippine accounts are superior in this respect.

However, the Philippine accounts submerge government investment in the capital accounts; they do not show it as a separate category of total investment.

For purposes of fiscal policy analysis, it is important to be able to calculate total government expenditures, current consumption plus capital investment. Only by such a calculation can the analyst assess the net impact of governments taxing and spending programs.

I appreciate the difficulties of measuring government capital expenditures as distinct from business capital expenditures. Nevertheless, if government current expenditures can be measured from G.A.O. or other published government documents, it should be feasible to measure government capital expenditures from the same documents plus, if necessary, reports from government-owned business enterprises. And it should be possible to check the total expenditure figure from the financial records of the treasurer.

For purposes of facilitating fiscal policy analysis, I would recommend that, however, difficult, a separate estimate be made. Whether it should be entered in the business (capital) account or in the government account is a matter of judgment; my preference would be to enter it in the government account, but separate from government consumption expenditures. Wherever it is entered, analysts using the accounts will have to calculate appropriate totals for their individual purposes.

Treatment of Social Security Transactions

I am unable to determine from the tables available to me just how social security taxes (contributions) and benefits are treated in the Philippine accounts, but it appears that contributions to social insurance are not included in government receipts. If they are not, then it would follow logically that social security benefits would not be included in personal income.

This treatment (if in fact it is the treatment) presumably reflects the legal fiction that social insurance is the equivalent of voluntary private insurance, i.e. that social security taxes are insurance premiums, not taxes. There may well be adequate political reasons for maintaning this fiction, in this country as in the U.S.A. But for purposes of economic analysis, social security taxes are an involuntary payment, and are just as much a tax as any other tax.

They have the same effect on the current flow of income as any other tax. They divert income from persons to government. Spendable income is reduced by the amount of social security taxes collected, and it would therefore be proper to deduct them in deriving disposable personal income.[1]

The fact that it is legally possible for insured persons to borrow against their equity in the social insurance fund does not, in my judgment, alter this conclusion. Such a loan would be a financial transaction, not an income transaction, and like other loans should be excluded from the national income accounts. The provision in the law permitting an insured person later to borrow from the fund does not negate the fact that, at the time the social security tax is levied, it is a tax, not a voluntary act of saving.

Similarly, social security benefits are a transfer of income from government to persons, and should be added to national income in the calculation of personal income.

Additional detail

I realize that suggesting the desirability of additional detail in the national accounts probably gets us into the problem of estimating procedures (i.e. lack of detail may be attributable to the inadequacies of available basic data), but on the chance that some additional detail would be possible within the limitations of existing data, let me suggest a few items which would be very helpful to the forecaster and policy maker.

---

[1] Whether social security taxes paid by employees should be deducted from national income (defined as income *earned*) in deriving personal income (defined as income *received*), or from personal income in deriving disposable income, is a debatable point. Social security taxes paid by employ*ers* should clearly be deducted from national income; employees did *not* receive this income. But it can be argued that withheld social security taxes were in fact received by the employee and then paid back to government, just as withheld income taxes are considered to have been received and paid back to government. Actually, it makes little difference where they are deducted, as long as they are deducted before disposable income.

(1) Personal consumption expenditures. The present accounts give only a total figure. Consumer behaviour with respect to nondurable goods and services (chiefly food, clothing and housing services), however, often differs significantly from their behavior with respect to durable goods. It would be helpful if a separation between nondurable goods and services, and durables, especially automobiles, could be made.

(2) Increase in stocks. The present accounts give no subtotals for business vs. agriculture. The determinants are quite different. Further, it is reasonable to suppose that the proportion of the stock change figure attributable to nonagricultural industries has increased substantially as economic development has progressed. The extent of this change is an important statistic. A breakdown would be helpful.

(3) General government consumption. National government expenditures are, of course, much more subject to policy control than provincial and local government expenditures. A breakdown would therefore be helpful. The same would hold for capital expenditures, although I assume that capital expenditures of provincial and local governments are so small that no serious error is involved by lumping them with those of the national government.

(4) Corporate profits. The present accounts give figures for corporate taxes and corporate saving (undistributed profits), but the third component of corporate profits, dividends, is buried in the item, "Entrepreneurial and property income of persons." It would be very helpful to have dividends reported separately or, alternatively, to have the total corporate profits figure shown. I assume from the fact that corporate saving and corporate taxes are shown that the figure is readily available.

(5) Fixed capital formation. The need for a distinction between government and private capital formation has been discussed above. Another distinction would also be helpful.

The present accounts show a breakdown of domestic capital formation by type of equipment (machinery other than electrical, elctrical machinery, transport equipment, miscellaneous equipment, with subdetail for each). This admirably detailed breakdown is useful for certain purposes, but for forecasting and policy making purposes, a breakdown by type of industry making the *expenditures* for capital equipment would be more useful.

Such detail would no doubt require periodic sample surveys of capital expenditures by leading corporations, the results of which would be "blown up" into an estimate for the economy as a whole. At the same time that such a sample survey was conducted, the respondents could be asked for estimates of their *planned* capital expenditures for a future period of time. Such information would be extremely useful.

Methodology supplement

Finally, let me make a plea to OSCAS to publish an up-to-date supplement to the accounts which describes in some detail the definitions employed, the estimating procedures for the various items in the accounts, and the reasons for omitting from the accounts certain items or detail which OSCAS would like to provide but which, for good statistical reasons, cannot be provided.

A methodological supplement to the published figures would facilitate use of the data, and should invite suggestions from persons who know national income accounting and who know the Philippine economy that would help OSCAS make further improvements in the accounts. It would alert users of the accounts to the problems involved in using the data, and could well preclude the drawing of inappropriate inferences from admittedly imperfect data. And it would help newcomers to the Philippines, like myself, to use the accounts in a more intelligent manner.